

# WASHAKIE COUNTY ANNEX

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## 1 Mitigation Planning History and County Planning Team

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This County Annex builds upon previous versions of the Washakie County Hazard Mitigation Plan completed in 2007 and 2011. In 2016 the County joined the Region 6 Regional Hazard Mitigation Plan.

The following entities participated in the DMA planning process through the Washakie County Planning Team (CPT) in 2007, 2011 and 2016. The participating jurisdictions include:

- Washakie County
- City of Worland
- Town of Ten Sleep

More details on the planning process followed and how the County, municipalities and stakeholders participated can be referenced in Chapter 3 of the base plan. Additional details on what local government departments participated and who represented them are listed in Appendix A.

## 2 Geography and Climate

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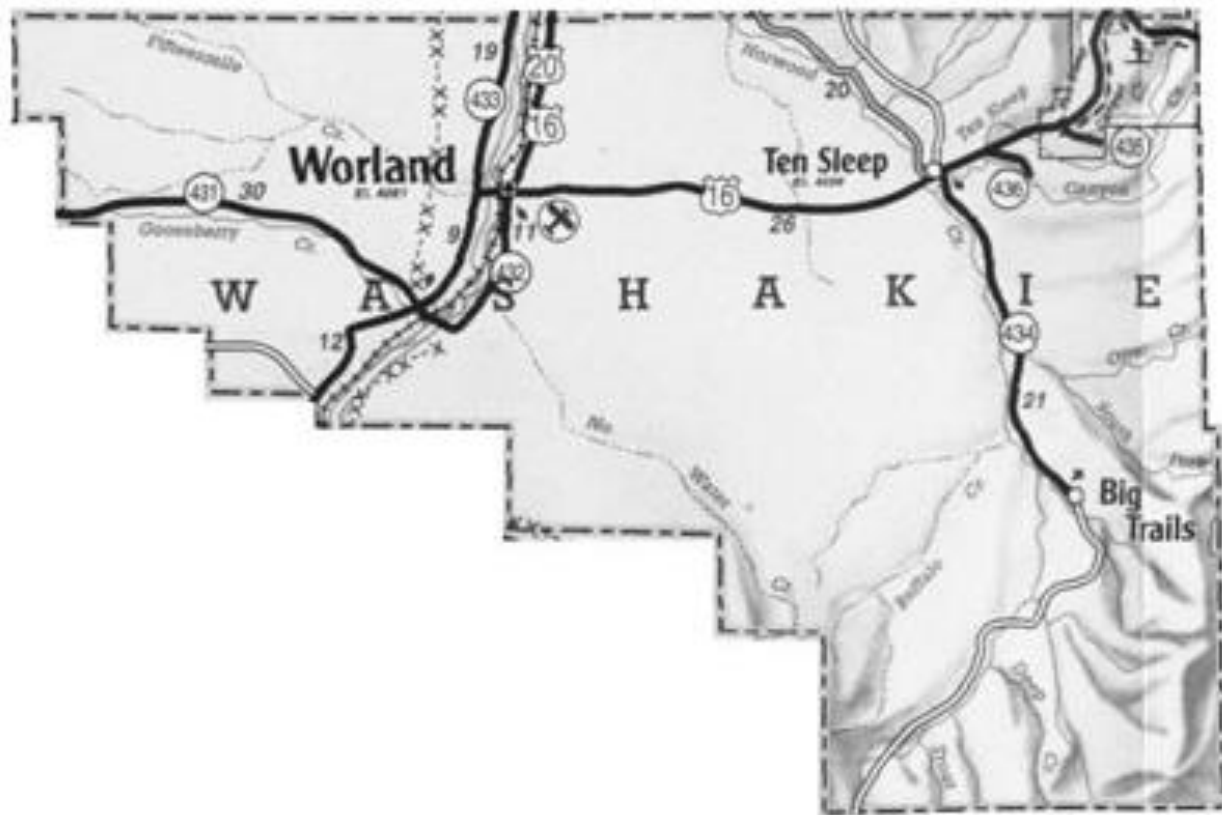
Named after one of the most renowned Shoshone leaders in American history, Washakie County is nestled in the heart of the Bighorn Basin in north-central Wyoming with the Big Horn Mountains rising along its eastern border. The County's two incorporated communities include the City of Worland and the Town of Ten Sleep. It is bordered by Big Horn County to the north, Johnson County to the east, Natrona County to the south, Fremont County to the southwest, Hot Springs County to the west, and Park County to the northwest. Washakie County has a total area of 2,243 square miles.

- The City of Worland is located at an elevation of 4,065 feet and has a total area of 4.2 square miles.
- The Town of Ten Sleep is located at an elevation of 4,426 feet and has a total area of 0.2 square miles.

Washakie County is favored by 310 days of sunshine a year. The average annual rainfall and snowfall are 7.8" and 21.1" respectively. The average annual temperature is 44.6° with the average yearly humidity being roughly 50% (<http://www.worlandchamber.com/facts.htm>). The Bighorn River flows northerly through the County, with Worland lying close to its banks. The Norwood River, a tributary of the Bighorn, also passes through Washakie County. Worland, the county seat, lies just west of the foothills of the Big Horn Mountains.

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**Figure 2.1. Washakie County Base Map**



Major topographical features include the Big Horn Mountains. Agricultural lands are a dominant part of the landscape with 426,500 acres of farms and ranchland and 46,785 acres of cropland. Part of Big Horn National Forest lies in the northwestern part of the County. There are five vegetation zones in Washakie County including sub-alpine, montane, foothills, basins and badlands. Vegetation in these zones varies widely from shrubs, sagebrush, and grasses to aspen trees, cottonwood trees, Russian olive trees, Lodgepole Pine, Douglas Fir, Ponderosa Pine, spruce, fir, and juniper (Washakie County Conservation District, <http://www.conservwy.com/lrpfinl.pdf>).

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## 3 History

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“The County has one of the earliest known human occupations of North America; the Colby Site; located just east of the City of Worland about two miles on U.S. Highway 16. A mammoth kill site, known as the “Colby Site”, dates back approximately 11,200 years” (<http://washakiecounty.net/cmpdrft.htm>).

Centuries later, the Big Horn Basin area was home to multiple Native American tribes, mainly the Crow and Shoshone but occasionally the Blackfoot and Northern Cheyenne as well. Mountain men and fur traders entered the area in the early 19<sup>th</sup> century and continued to seek their livelihoods there until the collapse of the fur trade in the mid-19<sup>th</sup> century.

The Big Horn Basin came under the control of the US Government with the Louisiana Purchase of 1803. It became part of the Nebraska Territory in 1854, the Dakota Territory in 1861, and finally the Wyoming Territory in 1868. Several US military forts were built in the area, which was simultaneously claimed by the Cheyenne and Sioux. Multiple battles and skirmishes were fought to keep the Bozeman trail open for white settlers migrating west, but the forts were ultimately closed during the Civil War. Chief Washakie, “the last chief of the Eastern Shoshone Nation” (Washakie Comprehensive Plan - <http://washakiecounty.net/cmpdrft.htm>), remained friendly to white settlers and allowed them to pass through the area unhindered.

Washakie County was established by the Wyoming State Legislature on February 9, 1911. It was named after Chief Washakie who was widely respected for his wisdom and pursuit of peace in the region. The City of Worland was founded in the early 20<sup>th</sup> century and named after Charlie Worland, who ran a trading post along the Bridger Trail on the west side of the Big Horn River. The Town of Ten Sleep was a centrally located area “between the Great Sioux Camps and the Platte River to the South, and the northern camp located near Bridger, Montana” ([http://www.worlandchamber.com/about\\_ten\\_sleep.htm](http://www.worlandchamber.com/about_ten_sleep.htm)). The area was 10 days travel, or “10 sleeps” from each of these locations, hence the name Ten Sleep.

## 4 Population

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The total population of Washakie County is 8,367. The population for each of the incorporated areas are provided in Table 4.1.

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**Table 4.1. Population Estimates for Incorporated Communities 2010-2015**

	2010	2011	2012	2013	2014	2015
City of Worland	5,494	5,448	5,443	5,442	5,362	5,372
Town of Ten Sleep	262	259	256	257	253	254

Source: U.S. Census, [www.census.gov/](http://www.census.gov/)

Select Census demographic and social characteristics for Washakie County are shown in Table 4.2. The table indicates the proportion of the population that may have special needs, such as elderly or children under 5 years of age.

**Table 4.2. Washakie County Demographic Profile**

<b>Washakie County</b>	
<b><i>Population</i></b>	
Population estimates base, April 1, 2010, (V2015)	8,533
Population, percent change - April 1, 2010 (estimates base) to July 1, 2015, (V2015)	-2.4
Population, Census, April 1, 2010	8,533
<b><i>Age and Sex</i></b>	
Persons under 5 years, percent, July 1, 2015, (V2015)	5.5
Persons under 18 years, percent, July 1, 2015, (V2015)	23.7
Persons 65 years and over, percent, July 1, 2015, (V2015)	20.3
Female persons, percent, July 1, 2015, (V2015)	49.1
<b><i>Race and Hispanic Origin</i></b>	
White alone, percent, July 1, 2015, (V2015) (a)	94.7
Black or African American alone, percent, July 1, 2015, (V2015) (a)	0.7
American Indian and Alaska Native alone, percent, July 1, 2015, (V2015) (a)	1.7
Asian alone, percent, July 1, 2015, (V2015) (a)	0.7
Native Hawaiian and Other Pacific Islander alone, percent, July 1, 2015, (V2015) (a)	0.1
Two or More Races, percent, July 1, 2015, (V2015)	1.9
Hispanic or Latino, percent, July 1, 2015, (V2015) (b)	14.3
White alone, not Hispanic or Latino, percent, July 1, 2015, (V2015)	82.2
<b><i>Education</i></b>	
High school graduate or higher, percent of persons age 25 years+, 2010-2014	89.1
Bachelor's degree or higher, percent of persons age 25 years+, 2010-2014	21.2

Source: U.S. Census Bureau, [www.census.gov/](http://www.census.gov/)

\*Hispanic or Latino is considered to be an ethnicity and not a race. People who identify themselves as Hispanic or Latino can belong to one or more races. Therefore, the total percentage can be greater than 100%.

## 4.1 Development Trends

The Washakie Development Association is a private economic development organization for Washakie County that assists private businesses with relocation and expansion in Worland, Ten Sleep and the rest of the county. WDA states "Washakie County has the most diversified economy in the State of Wyoming on a per capita basis."

As indicated in the previous section population has been declining in the County. Some development has occurred since the 2010 plan including:

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- Commercial development in west Worland. This area was developed near the Bighorn River, but GIS was used to guide the location so that it was outside of floodplain and expansive soil areas.
  - Residential development in east Worland (no hazard issues).
  - Affordable housing development outside of Ten Sleep on former BLM land. It is unknown if more land is going to be made available for further development.
  - The oil industry downturn may result in a number of well, tank, and treater sites that , with the lack of funding may have preventive maintenance shortfalls. This coupled with the loss of experienced personnel in the oilfield due to layoffs, could create a hazardous environment.
  - Others?

Continued growth has occurred in the Wildland Urban Interface in Washakie County as a whole; both in the Worland and the Ten Sleep areas. Residential development is ongoing in Canyon Creek County and Village, areas just outside of Ten Sleep noted for their scenic beauty. Both areas are identified as Firewise communities. It is important to note that neither the County nor the two incorporated communities have zoning ordinances to govern people building in the wildland-urban interface. Given the natural beauty in the County, and the less restrictive building requirements it is expected that people will continue building their homes in the wildland-urban interface outside of City and Town boundaries. This may increase the risk to people and property from hazards such as wildland fire.

## **5 Economy**

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In spite of its comparatively small population, Washakie County's business sector is rich in diversity. Washakie has a total of 657 businesses. Major Washakie businesses and employers include Wyoming Sugar Company, Fremont Beverages – Pepsi-Cola Bottling plant, Coors Brewing Company, Bentonite plant, Crown Cork & Seal, NOCORA, Bureau of Land Management, Washakie Medical Center of Banner Health, and several others. According to the Washakie County Community Profile, the leading industries in 2015 were construction, retail, health care and social services, accommodation and food services, and public administration.

Washakie County has a labor force of 4,168 people, with a job growth rate of 1.48% since 2014 and an unemployment rate of 5.3%.

Select economic characteristics for Washakie County from the 2010 U.S. Census are shown in Table 5.1.

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**Table 5.1. Washakie Economic Characteristics**

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Characteristic	Washakie County
In civilian labor force, total, percent of population age 16 years+, 2010-2014	63.9
In civilian labor force, female, percent of population age 16 years+, 2010-2014	61.6
Total accommodation and food services sales, 2012 (\$1,000) (c)	11,642
Total health care and social assistance receipts/revenue, 2012 (\$1,000) (c)	51,647
Total manufacturers' shipments, 2012 (\$1,000) (c)	187,499
Total merchant wholesaler sales, 2012 (\$1,000) (c)	15,837
Total retail sales, 2012 (\$1,000) (c)	95,392
Total retail sales per capita, 2012 (c)	11,270
Median household income (in 2014 dollars), 2010-2014	45,696
Per capita income in past 12 months (in 2014 dollars), 2010-2014	26,922
Persons in poverty, percent	12.6
Total employer establishments, 2014	366
Total employment, 2014	2,846
Total annual payroll, 2014	105,598
Total employment, percent change, 2013-2014	-4.7
Total nonemployer establishments, 2014	668

Source: U.S. Census Bureau, [www.census.gov/](http://www.census.gov/)

## 6 Hazard Identification and Risk Assessment

### 6.1 Identified Hazards

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The HMPC reviewed significant hazards from the 2011 Washakie County Hazard Mitigation Plan inclusion in the 2016 Regional hazard mitigation plan. The hazards list was compared with the hazards list found in the State of Wyoming's hazard mitigation plan, updated in 2016. Upon further review, the HMPC added lightning and mine subsidence hazards to be more consistent with the State's plan. The following table notes the summary of significance for each jurisdiction in the County.

**Table 6.1. Overall Hazard Significance Summary Table**

Hazard	City of Worland	Town of Ten Sleep	Washakie County
Avalanche	L	L	L
Dam Failure	M	M	M
Drought	H	H	H
Earthquake	M	M	M
Expansive Soils	L	L	L
Extreme Cold	H	H	H
Flood	H	M	H
Hail	M	M	M
Landslide	L	L	L
Lightning	L	L	L
Mine Subsidence	NA	NA	L
Tornado	M	M	M
Wildfire	M	H	H
High Wind and Downbursts	L	L	L
Winter Storm	M	M	M
Hazardous Materials	H	M	M

#### Geographic Extent

Negligible: Less than 10 percent of planning area or isolated single-point occurrences

Limited: 10 to 25 percent of the planning area or limited single-point occurrences

Significant: 25 to 75 percent of planning area or frequent single-point occurrences

Extensive: 75 to 100 percent of planning area or consistent single-point occurrences

#### Potential Magnitude/Severity

Negligible: Less than 10 percent of property is severely damaged, facilities and services are unavailable for less than 24 hours, injuries and illnesses are treatable with first aid or within the response capability of the jurisdiction.

Limited: 10 to 25 percent of property is severely damaged, facilities and services are unavailable between 1 and 7 days, injuries and illnesses require sophisticated medical support that does not strain the response capability of the jurisdiction, or results in very few permanent disabilities.

Critical: 25 to 50 percent of property is severely damaged, facilities and services are unavailable or severely hindered for 1 to 2 weeks, injuries and illnesses overwhelm medical support for a brief period of time, or result in many permanent disabilities and a few deaths.

Catastrophic: More than 50 percent of property is severely damaged, facilities and services are unavailable or hindered for more than 2 weeks, the medical response system is overwhelmed for an extended period of time or many deaths occur.

#### Probability of Future Occurrences

Unlikely: Less than 1 percent probability of occurrence in the next year, or has a recurrence interval of greater than every 100 years.

Occasional: Between a 1 and 10 percent probability of occurrence in the next year, or has a recurrence interval of 11 to 100 years.

Likely: Between 10 and 90 percent probability of occurrence in the next year, or has a recurrence interval of 1 to 10 years

Highly Likely: Between 90 and 100 percent probability of occurrence in the next year, or has a recurrence interval of less than 1 year.

#### Overall Significance

Low: Two or more of the criteria fall in the lower classifications or the event has a minimal impact on the planning area. This rating is also sometimes used for hazards with a minimal or unknown record of occurrences/impacts or for hazards with minimal mitigation potential.

Medium: The criteria fall mostly in the middle ranges of classifications and the event's impacts on the planning area are noticeable but not devastating. This rating is also sometimes utilized for hazards with a high impact rating but an extremely low occurrence rating.

High: The criteria consistently fall along the high ranges of the classification and the event exerts significant and frequent impacts on the planning area. This rating is also sometimes utilized for hazards with a high psychological impact or for hazards that the jurisdiction identifies as particularly relevant.

## 6.2 Building Inventory and Assets

In addition to people there are buildings, critical facilities and infrastructure, and other important assets in Washakie County are potentially exposed to hazards identified in this plan. Table 6.2 summarizes the property inventory for the County and each participating jurisdiction, based on improvement value (i.e. structures) and includes the building count and value grouped by parcel type and jurisdiction. This as an assessment of the overall property exposed within the County and by jurisdiction.

The 2016 Parcel and Assessor Data was obtained through the Wyoming Cama website (<http://cama.state.wy.us/>) which is maintained by the Wyoming Department of Revenue. This information provided the basis for building exposure and property types. The available data is annually updated on the site and contains all counties within Wyoming. Data current as of 2015 was downloaded for all the counties within the Region and joined by Parcel Number in a separate database for analysis using GIS. The focus of the analysis was on “improved” or developed parcels. These parcels were identified based on an improvement value greater than zero. Abstract Codes were used to identify occupancy type as shown in the following table, which includes summations of total improved value for the various property types.

**Table 6.2. Washakie County Building Inventory and Value by Jurisdiction**

Jurisdiction	Property Type	Building Count	Improved Value	Est. Content Value	Total Exposure
Ten Sleep	Commercial	10	\$974,134	\$974,134	\$1,948,268
	Residential	18	\$1,772,020	\$886,010	\$2,658,030
	<b>Total</b>	<b>28</b>	<b>\$2,746,154</b>	<b>\$1,860,144</b>	<b>\$4,606,298</b>
Worland	Commercial	307	\$46,944,527	\$46,944,527	\$93,889,054
	Industrial	22	\$8,769,415	\$13,154,123	\$21,923,538
	Residential	1,915	\$188,616,298	\$94,308,149	\$282,924,447
	Vacant Land	8	\$2,151,566	\$2,151,566	\$4,303,132
	<b>Total</b>	<b>2,252</b>	<b>\$246,481,806</b>	<b>\$156,558,365</b>	<b>\$403,040,171</b>
Washakie Unincorporated	Agricultural Production	169	\$31,441,332	\$31,441,332	\$62,882,664
	Commercial	96	\$12,856,157	\$12,856,157	\$25,712,314
	Exempt	3	\$638,609	\$638,609	\$1,277,218
	Industrial	18	\$4,425,603	\$6,638,405	\$11,064,008
	Residential	942	\$156,135,963	\$78,067,982	\$234,203,945
	Vacant Land	13	\$1,329,258	\$1,329,258	\$2,658,516
	<b>Total</b>	<b>1,241</b>	<b>\$206,826,922</b>	<b>\$130,971,742</b>	<b>\$337,798,664</b>
	<b>Grand Total</b>	<b>3,521</b>	<b>\$456,054,882</b>	<b>\$289,390,251</b>	<b>\$745,445,133</b>

Source: (<http://cama.state.wy.us/>)



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## 6.2.1 Critical Facilities, Infrastructure, and Other Important Community Assets

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. FEMA's HAZUS-MH loss estimation software uses the following three categories of critical assets. Essential facilities are those that if damaged would have devastating impacts on disaster response and/or recovery. High potential loss facilities are those that would have a high loss or impact on the community. Transportation and lifeline facilities are a third category of critical assets. Examples of each are provided below.

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**Table 6.3. Critical Facility Categories**

Essential Facilities	High Potential Loss Facilities	Transportation and Lifelines
<ul style="list-style-type: none"><li>• Hospitals and other medical facilities</li><li>• Police stations</li><li>• Fire stations</li><li>• Emergency Operations Centers</li></ul>	<ul style="list-style-type: none"><li>• Power plants</li><li>• Dams and levees</li><li>• Military installations</li><li>• Hazardous material sites</li><li>• Schools</li><li>• Shelters</li><li>• Day care centers</li><li>• Nursing homes</li><li>• Main government buildings</li></ul>	<ul style="list-style-type: none"><li>• Highways, bridges, and tunnels</li><li>• Railroads and facilities</li><li>• Airports</li><li>• Water treatment facilities</li><li>• Natural gas and oil facilities and pipelines</li><li>• Communications facilities</li></ul>

Table 6.4 displays the inventory of these critical facilities in Washakie County, by jurisdiction. Much of this data has been captured in secure GIS databases and could be used in an overlay analysis. This has been supplemented with limited GIS-based critical facility data from HAZUS-MH, for purposes of analysis, as illustrated in Table 6.4 and Figure 6.1 through Figure 6.3.

**Table 6.4. Washakie County Critical Facilities by Function**

<b>Jurisdiction</b>	<b>Facility Function</b>
<b>City of Worland</b>	
Washakie County Ambulance Service	Ambulance
Beehive Homes	Board Home
Worland Campground	Campground
Circuit Court of Washakie County	Circuit Court
Worland City Hall	City Government
Worland Municipal Court	City Government
NOWCAP Services, A.D.D.S	Community Action Program
NOWCAP-WIA Even Start	Community Action Program
Worland Community Center	Community Center
Washakie County Coroner	Coroner
Washakie County Courthouse	County Courthouse
Washakie County Agriculture Extension Office	County Government
Washakie County Public Health Office	County Health Office
Washakie County Health Officer	County Health Officer
District Court of the Fifth Judicial District - Worland	District Court
Washakie County Homeland Security and Emergency Management	Emergency Management
Wyoming Highway Patrol Division G - Worland	Highway Patrol
Washakie Medical Center	Hospital
Black Hills Bentonite	Industry
Coors Brewing Company	Industry

<b>Jurisdiction</b>	<b>Facility Function</b>
Washakie County Library	Library
Cloud Peak Counseling Center	Mental Health
Northern Wyoming Daily News	Newspaper
Worland Health Care and Rehabilitation Center	Nursing Home
Worland Police Department	Police
KWOR-AM	Radio-AM
KKLX-FM	Radio-FM
Eastside Elementary School	School
South Side Elementary School	School
St. Mary Magdalen Catholic School	School
West Side Elementary School	School
Worland High School	School
Worland Middle School	School
Worland Swimming Pool	School
Wyoming Boys School	School
Washakie County District #1 Admin	School District Administration
Washakie County Search and Rescue	Search and Rescue
Worland Senior Citizen Center	Senior Center
Washakie County Sheriff's Department	Sheriff
Armory Vehicle Storage and WY National Guard	State Government
Fire Prevention & Electrical Safety	State Government
State of Wyoming Family Services	State Government
WY State Engineer's Office	State Government
WY State Mine Inspector	State Government
Wyoming Department of Transportation - Worland	State Government
Wyoming Game and Fish Worland Game Warden Station	State Government

<b>Jurisdiction</b>	<b>Facility Function</b>
Wyoming WIC Program	State Government
Forest Service - Bighorn National Forest - Powder River District - Worland Office	US Department of Agriculture
Natural Resources Conservation Service - Worland Field Office	US Department of Agriculture
Washakie County Conservation District	US Department of Agriculture
Bureau of Land Management - Worland Field Office	US Department of the Interior
US Postal Service - Worland	US Postal Service
Public Works Department	Utility
Rocky Mountain Power	Utility
RT Communications	Utility
Wyoming Gas	Utility
Worland Fire Protection District #1 Fire Station	Fire & Rescue Response
<b>Town of Ten Sleep</b>	
Deer Haven Resort	Campground
Gallatin Canyon Campgrounds	Campground
Ten Broek RV Park	Campground
Ten Sleep Town Hall	City Government
Ten Sleep Community Learning Center	School
Ten Sleep Schools	School
Washakie County District #2 Admin	School District Administration
Ten Sleep Senior / Community Center	Senior Center
Bighorn Mountain Resort	Ski Area
Wyoming Department of Transportation - Ten Sleep	State Government
Wyoming Game and Fish Ten Sleep Game Warden Station	State Government
Wyoming Game and Fish Ten Sleep Hatchery	State Government
US Postal Service - Ten Sleep	US Postal Service
Ten Sleep Fire Hall	Volunteer Fire Department

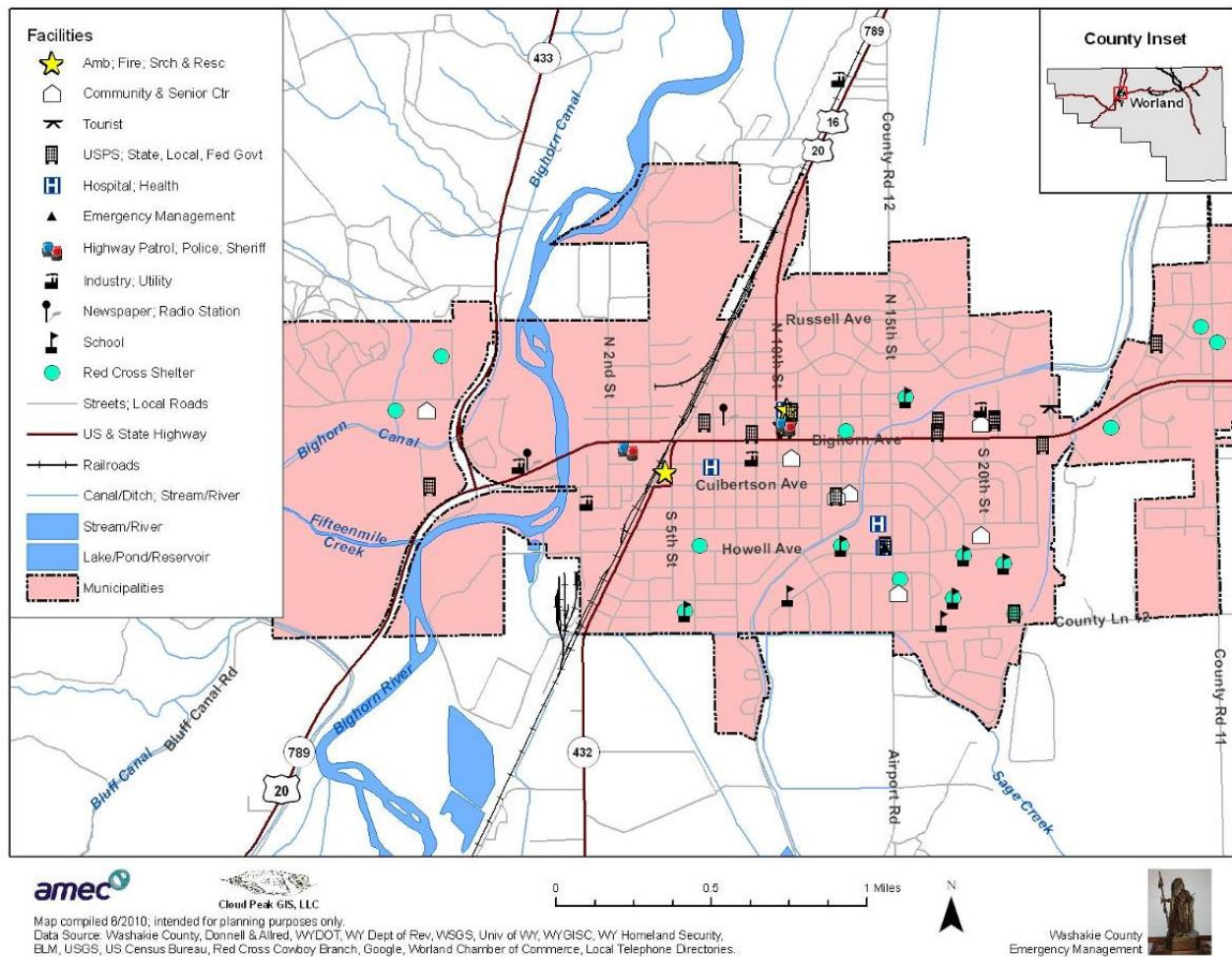
<b>Jurisdiction</b>	<b>Facility Function</b>
<b>Unincorporated Washakie County</b>	
Durkee Boat Ramp	Boat Ramp
Eggert Tract	Boat Ramp
Middle Fork of the Powder River Campground	Campground
Duck Swamp Environmental Education Area	EE Area
Big Cedar Ridge Fossil Plant Area	Fossils
Jim Bridger Trail	Historic Trail
So Big Horn Sheep Ranching Monument	Monument
Castle Gardens Scenic Area	Scenic
Gooseberry Badlands	Scenic
Canyon Creek Trail	Trailhead
Salt Lick Trail	Trailhead

In addition, over 360 Tier II hazardous materials facilities are located throughout the County. For homeland security reasons, these facilities are not displayed on the figures below. However, their mapped location is on file with Washakie County Homeland Security. The water system for the County and its municipalities was also identified as critical infrastructure. Specific water infrastructure was deemed sensitive by the Washakie County Sheriff and therefore was not included in this public document.

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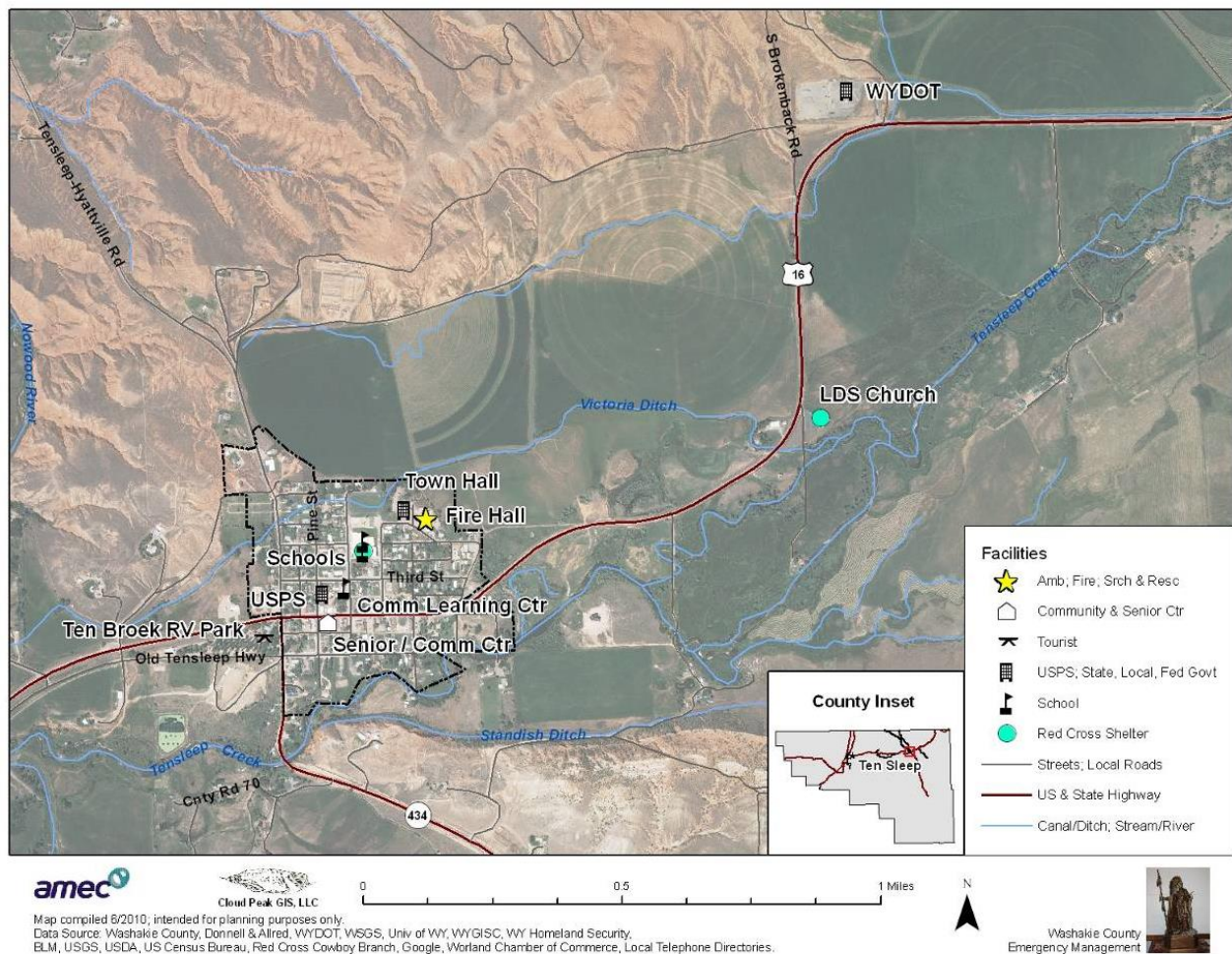


**Figure 6.2. City of Worland Critical Facilities (Detail View)**





**Figure 6.3. Town of Ten Sleep Critical Facilities**



## 6.2.2 Natural, Historic, and Cultural Assets

Assessing the vulnerability of Washakie County to disaster also involves inventorying the natural, historical, and cultural assets of the area. This step is important for the following reasons:

- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.



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## Historic and Cultural Resources

By definition, an historic property not only includes buildings of other types of structures, such as bridges and dams, but also includes prehistoric of Native American sites, roads, byways, historic landscapes, and many other features. Given the history of the County, these types of historic properties exist in the planning area.

Information about historic assets in Washakie County came from the following sources:

- The **National Register of Historic Places** is the Nation's official list of cultural resources worthy of preservation. The National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect historic and archeological resources. Properties listed include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. The National Register is administered by the National Park Service, which is part of the U.S. Department of the Interior.

Table 6.5 lists the properties and districts in Washakie County that are on the National Register of Historic Places.

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**Table 6.5. Washakie County Historic Properties**

Property	Jurisdiction	Address	Date Listed
Ainsworth House/Greet Ranch	Big Trails	Spring Creek Road	Sept. 11, 1986
Ten Sleep Mercantile/Ten Sleep Hardware Store	Ten Sleep	2 <sup>nd</sup> and Pine Streets	Sept. 11, 1986
Worland House	Worland	520 Culbertson	Feb. 27, 1986
Worland Ranch	Worland	U.S. Highway 20 and Wy 433	March 5, 1992

Sources: National Register Information System, [www.nr.nps.gov/](http://www.nr.nps.gov/)

## Natural Resources

Natural resources are important to include in benefit-cost analyses for future projects and may be used to leverage additional funding for projects that also contribute to community goals for protecting sensitive natural resources. Awareness of natural assets can lead to opportunities for meeting multiple objectives. For instance, protecting wetlands areas protects sensitive habitat as well as attenuates and stores floodwaters.

A number of natural resources exist in Washakie County. This includes wetlands, endangered species, and imperiled plant communities. Also, the scenery itself, and access to the scenic backcountry, are economic drivers for the County, Worland and Ten Sleep.

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## **Wetlands**

Wetlands are a valuable natural resource for communities, due to their benefits to water quality, wildlife protection, recreation, and education, and play an important role in hazard mitigation. Wetlands reduce flood peaks and slowly release floodwaters to downstream areas. When surface runoff is dampened, the erosive powers of the water are greatly diminished. Furthermore, the reduction in the velocity of inflowing water as it passes through a wetland helps remove sediment being transported by the water. They also provide drought relief in water-scarce areas where the relationship between water storage and streamflow regulation are vital.

## **Endangered Species**

To further understand natural resources that may be particularly vulnerable to a hazard event, as well as those that need consideration when implementing mitigation activities, it is important to identify at-risk species (i.e., endangered species) in the planning area. An endangered species is any species of fish, plant life, or wildlife that is in danger of extinction throughout all or most of its range. A threatened species is a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Both endangered and threatened species are protected by law and any future hazard mitigation projects are subject to these laws. Candidate species are plants and animals that have been proposed as endangered or threatened but are not currently listed.

As of July 2016, there are six federal endangered, threatened, or candidate species in Washakie County according to the U.S. Fish and Wildlife Service. These species are listed in Table 6.6 along with state listed species.

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**Table 6.6. Endangered and Threatened Species in Washakie County**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Type of Species</b>	<b>Status</b>
Bald eagle	Haliaeetus Leucocephalus	Bird	State Threatened (recovery)
Greater Sage-grouse	Centrocercus Urophasianus	Bird	Candidate
Mountain Plover	Charadrius Montanus	Bird	Proposed threatened
Black-footed Ferret	Mustela Nigripes	Mammal	Endangered
Canada Lynx	Lynx Canadensis	Mammal	Threatened
North American wolverine	Gulo luscus	Mammal	Proposed threatened

Source: <http://www.fws.gov/endangered/>

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## 6.3 Vulnerability to Specific Hazards

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This section details vulnerability to specific hazards, where quantifiable, only where it differs from that of the Region. The results of detailed GIS analyses used to estimate potential for future losses are presented here, in addition to maps of hazard areas and details by jurisdiction and building type. For a discussion of the methodology used to develop the loss estimates refer to Chapter 4 of the base plan. In many cases Chapter 4 contains information that differentiates the risk by county thus the information is not duplicated here. For most of the weather-related hazards the risk does not vary significantly enough from the rest of the Region and thus the reader should refer to Chapter 4. Only unique issues or vulnerabilities are discussed, where applicable.

- Avalanche
- Dam Failure
- Drought
- Earthquake
- Expansive Soils
- Flood
- Hail
- Hazards Materials
- Landslide, Debris Flow and Rockfall
- Lightning
- Mine Subsidence
- Tornado
- Wildfire
- High Wind and Downbursts
- Severe Winter Weather

### 6.3.1 Avalanche

Vulnerability to avalanche is limited to the higher terrain in the Big Horn Mountains but generally has little impacts except to the occasional back country enthusiast and first responders. Refer to Chapter 4 in the base plan for a discussion of general avalanche risk in the Region.

### 6.3.2 Dam Failure

There is one Class I and one Class II dam in Washakie County proper, however, there are many dams upstream in Fremont County which would have potentially the biggest impact on Washakie County. Chapter 4 in the base plan includes a table and map of Class I and Class II dams both in and upstream of the County.

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There is a high hazard dam above Ten Sleep (also known as Meadow Lark) along East Ten Sleep Creek. Ten Sleep Dam abuts a block slide complex, exposing the dam to landslide hazards. It is possible the dam could be breached if the landslide destabilizes. Flathead Dam along Gomer Gulch is a significant hazard dam in the county. Other dams in the county are low hazard dams.

Boysen Dam is located along the Wind River, another name for the upper Bighorn River in adjacent Fremont County. The current dam is operated by the U.S. Federal Bureau of Reclamation, and is an earth-filled dam with a structural height of 220 feet. Washakie County has emergency action plans on file for Boysen and Ten Sleep Dams. These emergency action plans include specific information on flood damages if either of these dams failed. However, due to the sensitive nature of this information, it is not included in this plan.

### **6.3.3 Drought**

Vulnerability to drought is not noticeably different from the rest of the region. During the 2016 Regional Plan development the HMPC noted that one of their water resources includes an aquifer used by Pepsi. Commercial use of a primary water source can impact and increase the effects of drought. Refer to the Chapter 4 in the Base Plan for a discussion of drought risk for the Region and Washakie County.

### **6.3.4 Earthquake**

Refer to the Chapter 4 in the Base Plan for a discussion of earthquake risk related to Washakie County.

### **6.3.5 Expansive Soils**

During the 2016 Regional Plan development, the HMPC noted the following consequences of expansive soils hazards in Washakie County:

- Highway 16 between Worland and Ten Sleep has several issues with expansive soil particularly near mileposts 9 to 12. An \$800,000 project is underway to address impacts to the highway. This road has heavy truck traffic; and
- Highway 434 also has issues.

The Town of Ten Sleep has had occasional problems with expansive soils. Refer to the Chapter 4 in base plan for further discussion of expansive soil risk related to the Region.

### **6.3.6 Flood**

Flood hazards affect areas of the county differently. The following maps show flood hazards in specific areas of Washakie County.

Figure 6.4. Washakie County Flood Hazards

# Washakie County DFIRM and HAZUS Flood Hazards

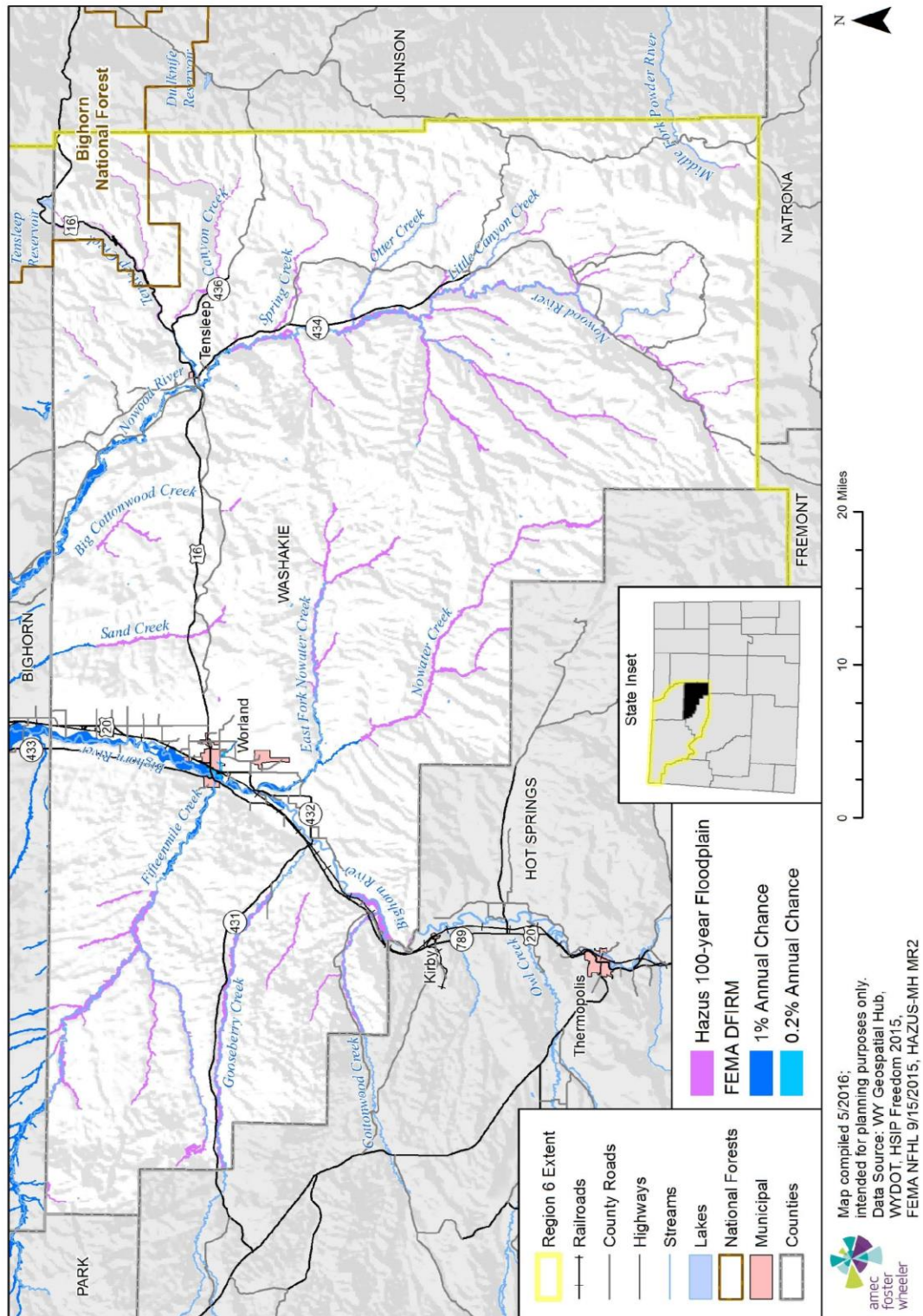




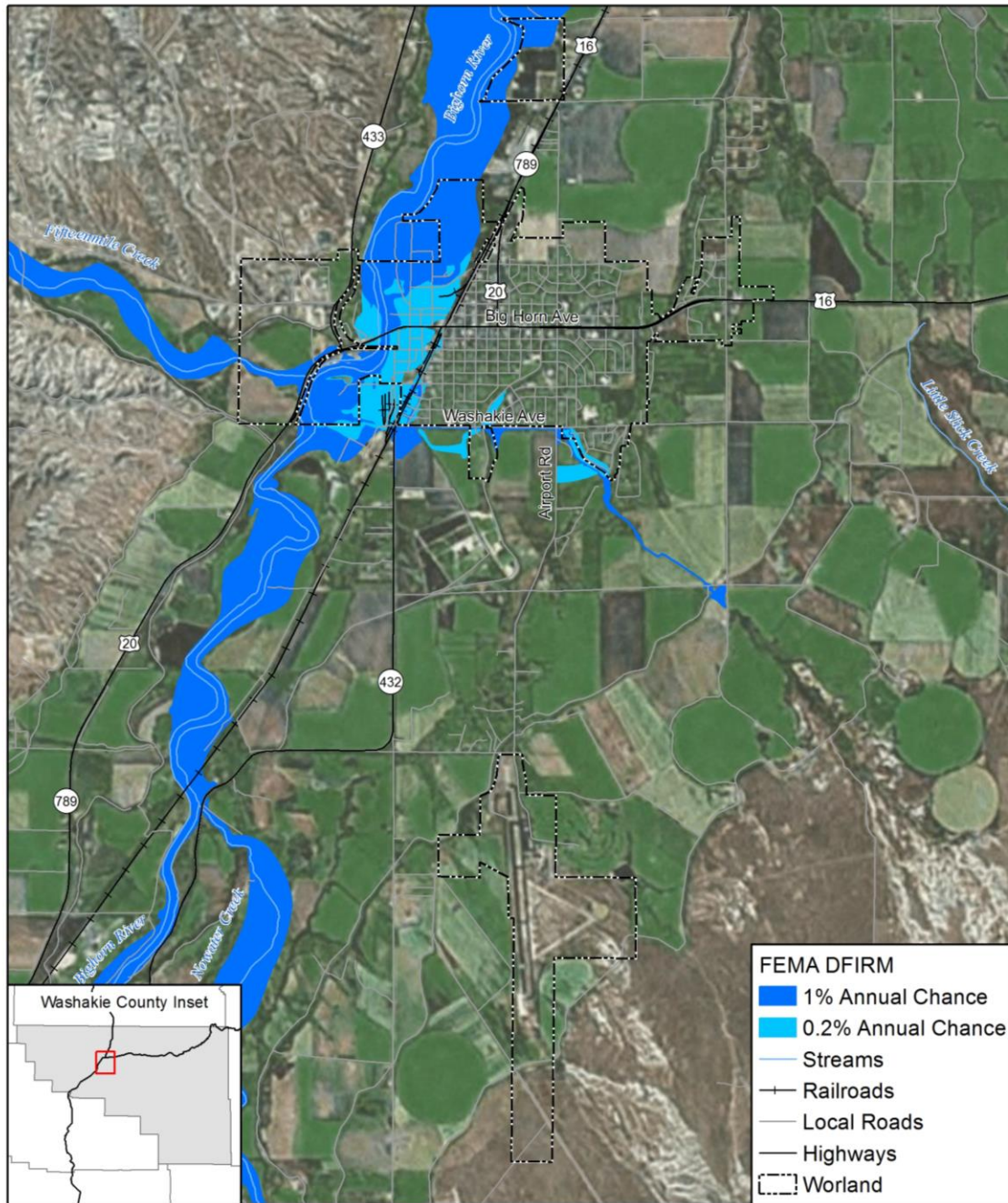
Figure 6.5. Town of Ten Sleep Flood Hazards





Figure 6.6. City of Worland Flood Hazards

## Town of Worland DFIRM Flood Hazards



Map compiled 5/2016;  
intended for planning purposes only.  
Data Source: WY Geospatial Hub,  
WYDOT, HSIP Freedom 2015,  
FEMA NFHL 9/15/2015

0 0.5 1 Miles



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## Flood Vulnerability Assessment

### ***Potential Loss in 100-year and 500-year Floodplains in Washakie County***

The following data results from analysis of available HAZUS and DFIRM data, and shows potential impacts from flooding, including the number of people vulnerable, total building exposure, and associated costs related to a 100 year or 1% annual chance flood and where data permits the 500 year or 0.2% annual chance flood. Two analyses are provided. The first is based on a GIS analysis using the latest DFIRM, which includes a LOMR that revised the floodplain in Worland in 2013. The results of a 2010 HAZUS flood analysis are also included to show additional economic losses and loss in areas that are not mapped by the NFIP.

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**Table 6.7. Summary of Floodplain Population Information**

	Total # of Buildings	Population Estimate
100 yr. flood	88	143
500 yr. flood	189	299
Total flood**	277	442

### ***DFIRM Analysis***

Washakie County has been mapped by the National Flood Insurance Program and has available Digital Flood Insurance Rate Maps (DFIRMs) for the northern section of the unincorporated county, including along the Bighorn River through Worland and along Ten Sleep Creek through Ten Sleep. DFIRM is considered to be best available data, and is therefore represented here for comparison purposes. The DFIRM 1% annual chance and 0.2% Annual Chance are represented on the *Flood Hazards* map at both the county scale and for each of the municipalities. Some areas of the unincorporated County are not mapped by FEMA and HAZUS generated flood hazard areas are used in the analysis as a proxy. A Letter of Map Revision in the City of Worland that became effective in 2013 significantly changed the flood risk and removed approximately 200 residential structures from the Sage Creek floodplain. See also the 2013 Flood Chapter Addition included in Appendix D.

Based on this analysis, the Washakie County area (including unincorporated county and the City of Worland) has significant assets at risk to the 100-year and greater floods. 88 improved parcels are within the 100-year floodplain for a total value of \$33M. 189 improved parcels fall within the 500-year floodplain for a total value of \$14M. Overall, unincorporated Washakie County, Worland, and Ten Sleep potentially face over \$15 M in losses from flooding. Approximately \$8 million of that is based on damage estimates from the 1% annual chance flood, with the remaining \$6.7M in damages resulting from the 0.2% annual chance flood. **Error! Reference source not found.** through **Error! Reference source not found.** detail the floodplain exposure



and loss estimates for Washakie County and Worland. Ten Sleep did not have developed parcels within its corporate limits that intersected flood hazard areas.

**Table 6.8. Exposure and Potential Loss in 100-year Floodplain by Jurisdiction and Property Type in Washakie County**

Jurisdiction	Property Type	Building Count	Improved Value	Est. Content Value	Total Exposure	Potential Loss
Worland	Commercial	7	\$814,051	\$814,051	\$1,628,102	\$407,026
	Industrial	1	\$3,531,770	\$5,297,655	\$8,829,425	\$2,207,356
	Residential	6	\$453,752	\$226,876	\$680,628	\$170,157
	Vacant Land	1	\$1,467,710	\$1,467,710	\$2,935,420	\$733,855
	<b>Total</b>	<b>15</b>	<b>\$6,267,283</b>	<b>\$7,806,292</b>	<b>\$14,073,575</b>	<b>\$3,518,394</b>
Washakie Unincorporated FEMA	Agricultural	8	\$1,356,895	\$1,356,895	\$2,713,790	\$678,448
	Commercial	4	\$126,107	\$126,107	\$252,214	\$63,054
	Residential	29	\$4,667,357	\$2,333,679	\$7,001,036	\$1,750,259
	<b>Total</b>	<b>41</b>	<b>\$6,150,359</b>	<b>\$3,816,681</b>	<b>\$9,967,040</b>	<b>\$2,491,760</b>
Washakie Unincorporated HAZUS	Agricultural	7	\$1,970,714	\$1,970,714	\$3,941,428	\$985,357
	Residential	25	\$3,538,729	\$1,769,365	\$5,308,094	\$1,327,023
	<b>Total</b>	<b>32</b>	<b>\$5,509,443</b>	<b>\$3,740,079</b>	<b>\$9,249,522</b>	<b>\$2,312,380</b>
	<b>Grand Total</b>	<b>88</b>	<b>\$17,927,085</b>	<b>\$15,363,051</b>	<b>\$33,290,136</b>	<b>\$8,322,534</b>

**Table 6.9. Exposure and Potential Loss in 500-year Floodplain by Jurisdiction and Property Type in Washakie County**

Jurisdiction	Property Type	Building Count	Improved Value	Est. Content Value	Total Exposure	Potential Loss
Worland	Commercial	46	\$5,863,977	\$5,863,977	\$11,727,954	\$2,931,989
	Industrial	16	\$1,755,077	\$2,632,616	\$4,387,693	\$1,096,923
	Residential	125	\$7,114,787	\$3,557,394	\$10,672,181	\$2,668,045
	Vacant Land	2	\$8,275	\$8,275	\$16,550	\$4,138
	<b>Total</b>	<b>189</b>	<b>\$14,742,116</b>	<b>\$12,062,261</b>	<b>\$26,804,377</b>	<b>\$6,701,094</b>
	<b>Grand Total</b>	<b>189</b>	<b>\$14,742,116</b>	<b>\$12,062,261</b>	<b>\$26,804,377</b>	<b>\$6,701,094</b>

### ***HAZUS Flood Loss Estimation***

The following results show potential impacts from flooding, including the number of people vulnerable, total building exposure, and associated costs related to a general flooding incident based on a 2010 HAZUS analysis.

**Table 6.10. Estimated Economic Losses from Flooding - HAZUS**

Municipality	Building Loss (\$K)	Contents Loss (\$K)	Inventory Loss (\$K)	Relocation Loss (\$K)	Capital Related Loss (\$K)	Wages Loss (\$K)	Rental Income Loss (\$K)	Total Loss (\$K)	# of Displaced People	# of People Needing Short Term Shelter
Tensleep	164	161	19	-	1	2	-	347	16	2
Worland	15,129	29,786	2,666	72	88	624	32	48,397	839	561
Unincorporated	8,373	8,139	631	14	18	80	5	17,260	423	167
<b>TOTAL</b>	<b>23,666</b>	<b>38,086</b>	<b>3,316</b>	<b>86</b>	<b>107</b>	<b>706</b>	<b>37</b>	<b>66,004</b>	<b>1,278</b>	<b>730</b>

**Table 6.11. HAZUS Loss Estimation Additional Analysis**

Municipality	2009 Population*	Total Exposure (\$K)	Building Loss (\$K)	Building Exposure (\$K)	% Building Loss	Contents Loss (\$K)	Contents Exposure (\$K)	% Contents Loss	Total Loss (\$K)	Per Capita Loss (\$)
Tensleep	328	30,728	164	19,151	0.9%	161	11,577	1.4%	347	1,058
Worland	5,054	593,123	15,129	347,993	4.3%	29,786	245,130	12.2%	48,397	9,576
Unincorporated	2,529	267,369	8,373	160,651	5.2%	8,139	106,718	7.6%	17,260	6,825
<b>TOTAL</b>	<b>7,911</b>	<b>891,220</b>	<b>23,666</b>	<b>527,795</b>	<b>4.5%</b>	<b>38,086</b>	<b>363,425</b>	<b>10.5%</b>	<b>66,004</b>	<b>8,343</b>

Source: <http://www.fema.gov/policy-claim-statistics-flood-insurance> and Wyoming Office of Homeland Security, State NFIP Coordinator

According to the HAZUS model output, Washakie County would suffer a total of \$66,004,000 in total direct economic loss to buildings and 1,278 people would be displaced in the event of a countywide 100-year flood. There would be a total of 195 damaged buildings, 30 of which would be substantially damaged (>50% damaged). The Big Horn River flows north across the county and through Worland. Ten Sleep Creek flows southeast through Ten Sleep before draining into the Norwood River, which flows north across the county. The City of Worland would suffer the most damage in the county, with a total direct economic loss for buildings of \$48,397,000 and 839 displaced people. The City of Worland also has the greatest Percent Building Loss (4.3%), Percent Contents Loss (12.2%), and Per Capita Loss (\$9,576) of the jurisdictions in the county. The total county, incorporated and unincorporated, would suffer 4.5% Building Loss, 10.5% Contents Loss, and \$8,343 Per Capita Loss.

### Flood Insurance Claims Analysis

The table below lists details regarding the 17 total flood insurance policies in the County. In the unincorporated County one of the policies is in a numbered A-Zone in the 100-year floodplain for a total coverage of \$40,000. The remaining two policies are Preferred Risk policies for properties outside of the mapped 100-year floodplain for a total coverage of \$700,000. In the Town of Ten Sleep, both policies are Preferred Risk policies for a total coverage of \$700,000. In the City of Worland, five policies are in the numbered A-Zone for a total coverage of \$1,431,600. There is one policy in the un-numbered A- Zone for coverage of \$64,000. The remaining four policies (three Preferred Risk) are for properties outside the mapped 100-year floodplain, for a total coverage of \$945,000.

**Repetitive Loss Properties:** There are no reported Repetitive Loss properties in the County.

**Community Rating System:** Neither the County nor any of the communities participate in the CRS program.

**Table 6.12. NFIP Insurance Policies and Claims Analysis (as of April 30, 2016)**

CID	Community Name	Total Policies	Total Coverage	Total Premium	Total Claims Since 1978	Total Claims Paid Since 1978	Total Payments Since 1978
560089	Unincorporated County	3	\$740,000	\$1,334	1	0	\$0
560055	Ten Sleep	2	\$700,000	\$785	0	0	
560056	Worland	12	\$2,568,200	\$9,260	3	0	\$0
<b>County Total</b>		<b>17</b>	<b>\$4,008,200</b>	<b>\$11,379</b>	<b>4</b>	<b>0</b>	<b>\$0</b>

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**Table 6.13. NFIP Mapping Information**

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CID	Community Name	FIRM Effective Date	NFIP Participation/Date Joined
560089	Unincorporated County	03/02/09	03/02/09
560055	Ten Sleep	03/02/09(M)	05/01/86
560056	Worland	03/02/09	09/15/78

### Critical Facility Analysis

A GIS analysis of critical facilities indicated that some are located in flood hazard areas. This includes 10 bridges and a Toxics Release Inventory (TRI) facility (Crown Beverage Packaging) in the 1% annual chance zone. Wyoming Sugar Co is another TRI facility located in the 0.2% annual chance zone. Three communications towers and a Wyoming Highway Patrol office is also located in this zone.

### 6.3.7 Hazardous Materials

Washakie County is susceptible to accidents involving hazardous materials on roads, highways, and at fixed facilities that manufacture, use, or store dangerous chemical substances. Primary issues of concern include chemicals used for agricultural purposes, such as pesticides and insecticides; grain storage; bentonite mining; storage, sale, usage and transportation of liquid propane gas; materials transported along the Burlington Northern Santa Fe rail line; federally regulated pipeline transportation systems; gas-fired residential appliances; and other miscellaneous examples. Certain facilities keep specific hazardous materials in storage, depending on the function of the facility.

A listing of the Risk Management Plan facilities present in Washakie County is presented in the table below. The chemicals that are extremely hazardous in Washakie County as a result of the RMP facilities are presented in Table 6.14 below. Most of these facilities are located in Worland. There are some potentially significant problems that could develop in Washakie County if select chemicals in Table 6.15 are released. No additional information is available for this plan due to Homeland Security concerns.

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**Table 6.14. Risk Management Plan (RMP) Facilities in Washakie County**

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County	Site
Washakie	Washakie Mid Stream (former Hiland Gas Plant)
Washakie	UAP Northwest, Basin

Washakie	Devon (formerly Worland Gas Plant)
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**Table 6.15. Hazardous Chemicals in Washakie County**

County	Chemical
Washakie	Butane Mix
Washakie	Fuels (Butane)
Washakie	Fuels (Gasoline)
Washakie	Fuels (Propane)
Washakie	Lubricant Oil
Washakie	Solvents (Methanol)
Others associated with Tier 2 Reporting	Anhydrous Ammonia, Liquid CO2, Liquid O2, and Liquid Nitrogen, Acids, etc.

Begun in 1988, the Toxics Release Inventory (TRI) is a federal program established by the U.S. Environmental Protection Agency that contains information on releases of nearly 650 chemicals and chemical categories from industries including manufacturing, metal and coal mining, electric utilities, and commercial hazardous waste treatment, among others. TRI facilities are required to file reports of their disposal or other environmental releases as well as other waste management quantities of regulated chemicals if they manufacture, process, or otherwise use more than the established threshold quantities of these chemicals. Washakie County has two facilities that report to the TRI: Crown Beverage Packaging and Wyoming Sugar Company, and over 360 Tier II sites report to the Local Emergency Planning Committee. The names of these facilities will not be discussed in this plan for Homeland Security reasons, but the reports are available at the Washakie County Homeland Security office.

The Worland fire station is located near the Burlington Northern Santa Fe Railroad, placing it at high risk should a train derail near the city and release hazardous materials. The Regional Emergency Response Team 6, a State of Wyoming asset, which provides services to Hot Springs, Big Horn, Park and Washakie counties, has some of its assets housed in the fire station. Further detail regarding the County's vulnerability to hazardous materials will not be discussed in this plan due to homeland security and public safety concerns. Washakie County Homeland Security worked with a local GIS contractor to estimate the County's vulnerabilities to simulated hazardous materials event scenarios. Therefore, the County is aware of potential threats and hazards and is prepared to address those issues should they arise.

### 6.3.8 Hail

Refer to Chapter 4 in the base plan for a discussion of hail risk related to Washakie County.

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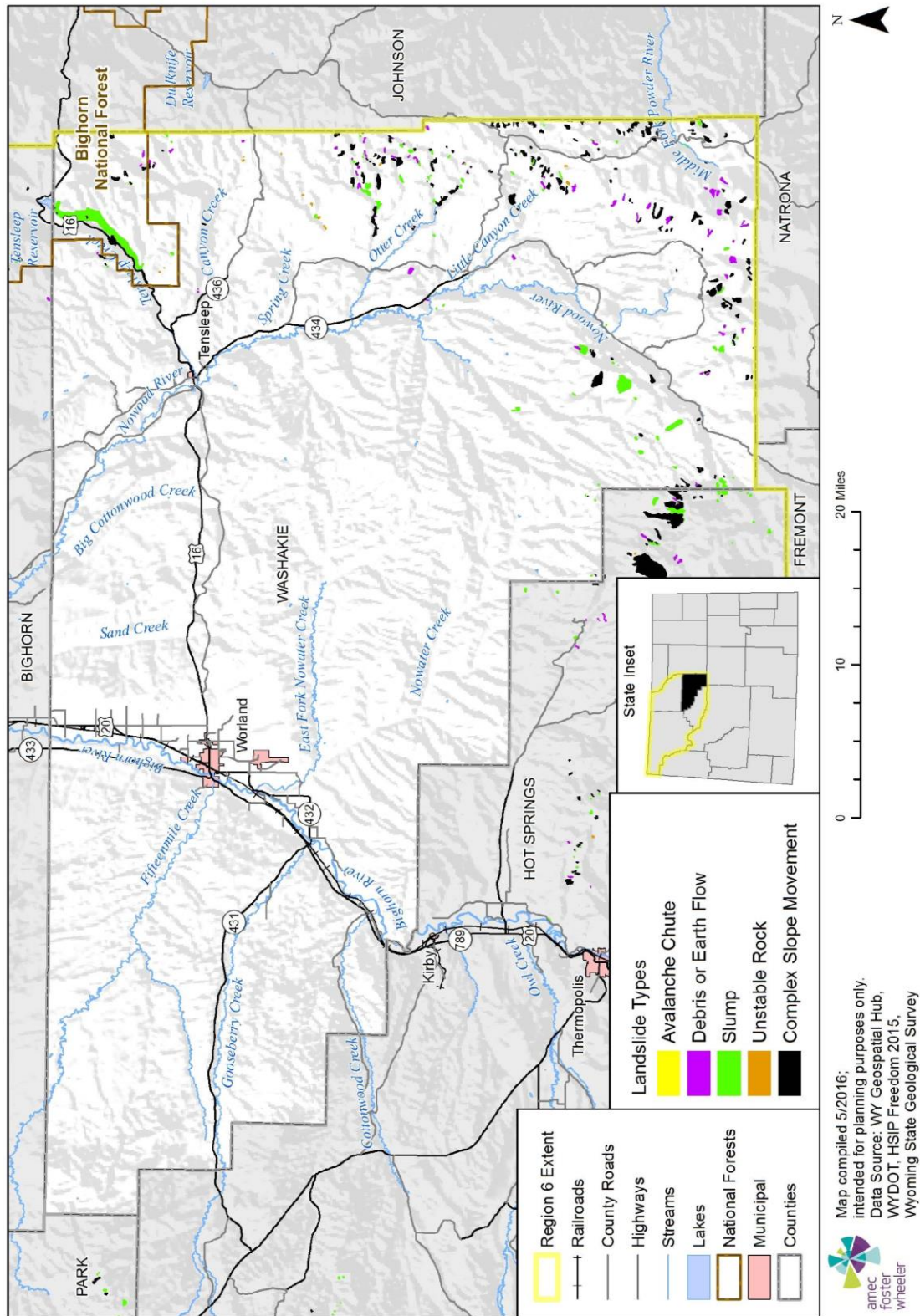
### 6.3.9 Landslide, Debris Flow and Rockfall

During the 2016 Regional Plan development, the HMPC noted the following consequences of landslide hazards in Washakie County:

- A slump near lower Nowood caused more than \$100,000 of damage;
- Highway 16 crosses an active landslide with potential for \$10 million in damages. Indirect losses would be significant due to long detours for truck and other traffic;
- In 2015, Highway 16 was closed on Memorial Weekend due to debris slides and rockfalls. The detours had impacts to Pepsi operations; and
- The large “earth crack” that gained national attention in the fall of 2015 was in Washakie County but did not do any damage.

Below is a map of landslide types in Washakie County. The majority of landslides occur in the unincorporated areas in the southeast corner of the county and along the Ten Sleep canyon. Many of these landslides intersect with highways or county roads. A table of highways intersecting landslide hazards is listed below. Refer to the Region 6 Landslide Appendix for more specific information on details of mapped landslides within the county.

**Figure 6.7. Washakie County Landslide Hazards**



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## Road Infrastructure Analysis

During the 2016 development of this regional plan a GIS analysis of highway and county road infrastructure risk was conducted. The exposure to landslide hazard areas was estimated by overlaying road networks on hazard areas and summarizing results. The results are summarized in the following table.

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**Table 6.16. Road Infrastructure Intersecting Landslide Hazard Areas**

County	Road Type	Segment Count	Length (ft)
Washakie	County Roads 80 and 81	2	3,538
	State Highway WY 434	1	91
	US Highway 16	2	3,419
	<b>Total</b>	<b>5</b>	<b>7,048</b>

## Critical Facility Analysis

No critical facilities intersected landslide hazard areas.

### 6.3.10 Lightning

During the 2016 Regional Plan development, the HMPC noted that lightning has occasional impacts including livestock losses and building impacts. Refer to Chapter 4 in the base plan for further discussion of lightning risk related to Washakie County and the Region. All jurisdictions are equally exposed to this hazard.

### 6.3.11 Mine Subsidence

The HMPC was not aware of issues of mine subsidence in the unincorporated county or municipalities. Refer to Chapter 4 in the base plan for a discussion of mine subsidence risk related to the Region and Washakie County.

### 6.3.12 Tornado

Refer to Chapter 4 in the base plan for a discussion of tornado risk related to Washakie County and the Region. All jurisdictions are equally exposed to this hazard.

### 6.3.13 Wildfire

Wildfire is a high significance hazard for the County, consistent with other counties in the Region. Refer to Chapter 4 in the base plan for additional discussion of the County's CWPP and wildfire risk related to Washakie County.



One method of estimating vulnerability to wildfires is to determine the value of structures that are located within Redzones, or wildland fire building exposure values. Wildland fire building exposure value is the value of buildings that can be potentially damaged by wildland fire in an area. The Redzone analysis also includes a buffer zone to exhibit potential areas at risk within 2 miles of the Redzone. Since wildfires can spread rapidly, it is important to consider areas close to the Redzone boundary. The table below summarizes Redzone exposure by property type and jurisdiction in Washakie County.

**Table 6.17. Wildfire Exposure in the Redzone in Washakie County**

Property Type	Building Count	Improved Value	Est. Content Value	Total Exposure	Population
Agricultural Production	6	\$261,692	\$261,692	\$523,384	
Commercial	4	\$722,243	\$722,243	\$1,444,486	
Residential	62	\$10,672,255	\$5,336,128	\$16,008,383	148
Vacant Land	3	\$706,142	\$706,142	\$1,412,284	
<b>County Total</b>	<b>75</b>	<b>\$12,362,332</b>	<b>\$7,026,205</b>	<b>\$19,388,537</b>	<b>148</b>
<b>All Region Total</b>	<b>675</b>	<b>\$133,817,097</b>	<b>\$78,090,612</b>	<b>\$211,907,709</b>	<b>1397</b>

### 6.3.14 High Wind and Downbursts

During the 2016 Regional Plan development, the HMPC noted the following consequences of high wind hazards in Washakie County:

- In 2012 multiple houses were hit by downed trees; power lines and roads were also affected; and
- In 2015 a downburst in Big Horn County affected camper trailers

Refer to the Chapter 4 in the base plan for a discussion of wind risk related to Washakie County.

### 6.3.15 Winter Weather

Refer to the Chapter 4 in the base plan for a discussion of winter weather risk related to Washakie County.

## 7 Mitigation Capabilities Assessment

As part of the 2011 plan update the County and participating jurisdictions developed a mitigation capability assessment which was updated again in 2016. Capabilities are those plans, policies and procedures that are currently in place that contribute to reducing hazard losses. Combining the risk assessment with the mitigation capability assessment results in “net vulnerability” to disasters and more accurately focuses the goals, objectives, and proposed actions of this plan. The HMPC used a two-step approach to conduct this assessment. First, an inventory of common

mitigation activities was made through the use of a matrix. The purpose of this effort was to identify policies and programs that were either in place or could be undertaken, if appropriate. Second, the HMPC conducted an inventory and review of existing policies, regulations, plans, projects, and programs to determine if they contribute to reducing hazard related losses.

## 7.1 Washakie County Mitigation Capabilities

This section presents Washakie County's mitigation capabilities as well as the capabilities of the City of Worland and the Town of Ten Sleep that are applicable to the planning area. This assessment describes existing capabilities, programs and policies currently in use to reduce hazard impacts or capabilities that could be used to implement hazard mitigation activities. It addresses regulatory mitigation capabilities and administrative/technical mitigation capabilities for the participating jurisdictions.

### 7.1.1 Washakie County Regulatory Mitigation Capabilities

Table 7.1 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Washakie County. Excerpts from applicable policies, regulations, plans and programs descriptions follow to provide more detail on existing mitigation capabilities.

**Table 7.1. Washakie County Mitigation Capabilities**

Regulatory Tool (ordinances, codes, plans)	Y/N	Comments
County Comprehensive Plan	Y	2004
Zoning ordinance	N	
Growth management ordinance	N	
Floodplain ordinance	Y	
Other special purpose ordinance (stormwater, steep slope, wildfire)	Y	Wildland Urban Interface ordinance
Building codes	N	
Fire department ISO rating	N/A	See Worland, Ten Sleep
Erosion or sediment control program	Y	Washakie County Conservation District
Stormwater management program	N	
Site plan review requirements	Y	
Capital improvements plan	Y	
Economic development plan	N	
Local emergency operations plan	Y	

Regulatory Tool (ordinances, codes, plans)	Y/N	Comments
Other special plans	N	
Flood insurance study or other engineering study for streams	Y	"FIS for Washakie County, Wyoming and Incorporated Areas" dated March 2, 2009
Elevation certificates (for floodplain development)	Y	
Flood Damage Prevention Resolution	Y	2009
Land Use Plan	Y	1978 (Replaced by Comprehensive Plan)
Subdivision & Development Regulations	Y	2010 Washakie County Subdivision and Development Regulations

Source: [www.washakiecounty.net](http://www.washakiecounty.net), HMPC

As indicated in the table above, Washakie County has several plans and programs that guide the County's mitigation of development in hazard-prone areas. Some of these plans and programs are described in more detail below.

### **Preliminary Report: Sage Creek Watershed, Worland, WY 1985**

Although it is several years old, this report still contains valuable information for flood mitigation in the planning area. This report investigates the feasibility of developing a plan for the Sage Creek Watershed. The watershed experiences problems with flooding, erosion, and sediment damage along Sage Creek and near Worland specifically. The report determines threshold levels at which flooding would cause damage to the City of Worland and croplands in the watershed. In order to address the flood threat posed by issues with Sage Creek, the report explores four different mitigation strategies. These four strategies include constructing a dam and reservoir along Sage Creek, enlarging the channel in pre-designated areas, creating a diversion channel to discharge Sage Creek floodwaters into Slick Creek, and creating a diversion channel along Airport Drain. Maps illustrating the potential strategies are included in the report. It was determined that all four strategies would offer flood protection from the 1% annual chance flood along Sage Creek. The feasibility of implementing these strategies is impeded by the construction costs. Therefore, alternative mitigation strategies were proposed including expanding the flood insurance program in the study area; flood proofing, removing obstructions caused by roads, bridges, and pipelines in certain areas; and replacing the Lower Hanover Canal structure, which would likely fail in the event of a large thunderstorm.

### **Washakie County Multi-Hazard Mitigation Plan update to Flood Chapter 2013**

In June 2011, FEMA approved the Washakie County Multi-Hazard Plan Flood Chapter (Flood Chapter). Later in 2011, Washakie County obtained a Flood Mitigation Assistance Program (FMA) Grant to make improvements to the Flood Chapter, with a focus on identifying possible flood hazard mitigation projects and strategies. In addition, from 2011 to 2012, the City of Worland prepared and submitted a Letter of Map Revision (LOMR) request to FEMA with the

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intention of obtaining a significant re-delineation of the Special Flood Hazard Area (SFHA) of the Sage Creek watershed. FEMA approved the LOMR and a new Flood Insurance Rate Map (FIRM) became effective for Sage Creek as of July 1, 2013.

The update to the Flood Chapter of the Washakie County Multi-Hazard Plan reflects the LOMR along Sage Creek and identified affected parcels, identified flood mitigation projects and developed an Action Plan to pursue those projects. The flood mitigation projects were identified by a series of four public meetings, various County employees, and WWC Engineering. Suggestions for additional data were made to further identify parcels at risk to flooding and eventually flood mitigation projects. The presented Action Plan outlines action items and presents guidance that will assist the County in pursuing flood mitigation projects. The Flood Chapter Update is included as Appendix D.

### **Washakie County Comprehensive Plan, 2004**

The 2004 Washakie County Comprehensive Plan was prepared by the County's Planning Commission to be used in making decisions that affect the physical, cultural and socioeconomic development of Washakie County. The plan's goals provide general statements reflecting the desires of County residents regarding the use of land. These goals also lay the groundwork for zoning and the land use decision-making process. The policies provide the County's positions as they relate to the identified goals and establish guidelines for direction or action. The overall goal of the plan is to allow gradual, long-term population and economic growth within the County in a manner that does not harm the County's scenery or character and residents' way of life.

### **Washakie County Flood Damage Prevention Resolution, 2009**

The 2009 Flood Damage Prevention Resolution was passed by the Board of County Commissioners to replace the 2000 Flood Damage Prevention Resolution (Resolution #152). The purpose of the 2009 Resolution is to minimize public and private losses from flooding. This endeavor includes protecting human life and health, employing cost-effective flood mitigation strategies that do not unduly draw from public money, minimizing flood severity to the extent possible, minimizing business interruptions, and minimizing structural damage from flooding. The resolution outlines methods of reducing losses from flooding. The plan establishes the role and responsibilities of the floodplain manager as well as land use provisions in flood hazard areas.

### **Washakie County Subdivision and Development Regulations, 2010**

The Board of County Commissioners enacted this resolution to protect the general welfare of the County and its residents. The resolution establishes regulations for subdivision and development design to help ensure public health and safety in addition to building a well-planned community.

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## 7.1.2 Washakie County Administrative and Technical Mitigation Capabilities

Table 7.2 identifies the County personnel responsible for activities related to mitigation and loss prevention in Washakie County.

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**Table 7.2. Washakie County Administrative/Technical Mitigation Capabilities**

Personnel Resources	Yes/No	Department/Position/Notes
Planner/engineer with knowledge of land development/land management practices	Y	Washakie County Planner
Engineer/professional trained in construction practices related to buildings and/or infrastructure	N	
Planner/engineer/scientist with an understanding of natural hazards	N	
Personnel skilled in GIS	N	
Full time building official	N	
Floodplain manager	Y	Washakie County Planner
Emergency manager	Y	Washakie County Homeland Security Coordinator
Grant writer	Y	Washakie County Attorney Office
Other personnel		
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Y	GIS data compiled for Washakie County Homeland Security by contractor; Assessors office
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	Y	Rapid Notify Emergency Notification System
Other		

In addition to the capabilities described in Table 7.1 and

Table 7.2, Washakie County has several other capabilities and programs related to hazard mitigation. Since 2005, the County has had an operational solar powered early warning system that provides public warning for tornadoes, floods, or inclement weather. This system includes a voice broadcast capability. Washakie County emergency management also teamed up with personnel from Hot Springs and Big Horn County to develop a Mobile Animal Rescue

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Evacuation Team (M.A.R.E.T.). Other capabilities include Community Emergency Response Teams (C.E.R.T.) and Search and Rescue (S.A.R.) teams, which frequently work together.

The following departments are involved in hazard mitigation in Washakie County:

### **County Commissioners**

Three commissioners comprise the planning area's governing body.

### **Planning Commission**

The Planning Commission makes recommendations to the County's governing body concerning matters related to planning, zoning and land use regulations.

### **Public Health Department**

The Public Health Department works to communicate, educate, and offer services that provide a healthy and safe environment to live and work in. For years, Public Health has been educating the public about emergency preparedness plans and disaster supply kits. The Department speaks at various community groups and provides informational booths and health fairs and other community gatherings.

### **Road and Bridge**

The Road and Bridge Department is responsible for the repair and maintenance of County roads within the planning area.

### **Washakie County Department of Homeland Security**

This office is responsible for emergency management countywide.

## **7.1.3 City of Worland Mitigation Capabilities**

### **City of Worland Regulatory Mitigation Capabilities**

Table 7.3 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the City of Worland. Excerpts from applicable policies, regulations, plans and program descriptions follow to provide more detail on existing mitigation capabilities.

**Table 7.3. City of Worland Regulatory Mitigation Capabilities Matrix**

Regulatory Tool (ordinances, codes, plans)	Y/N	Comments
General Plan	Y	Worland City Code
Zoning ordinance	Y	Worland City Code
Growth management ordinance	N	
Floodplain ordinance	Y	Worland City Code
Building codes	Y	Worland ICC adoptions: IBC, IPSDC, IRC (Statewide: IBC, IFC, IFGC, IMC)
Worland Fire Protection District ISO rating	Y	3/3 Y
Erosion or sediment control program	Y	Washakie County Conservation District
Stormwater management program	N	
Site plan review requirements	Y	Worland City Code
Capital improvements plan	Y	Ongoing
Economic development plan	Y	2014
Local emergency operations plan	Y	County EOP
Other special plans		
Flood insurance study or other engineering study for streams	Y	"FIS for Washakie County, Wyoming and Incorporated Areas" dated March 2, 2009-Sage Creek area updated July 2014
Elevation certificates (for floodplain development)	Y	Worland City Code
Flood Damage Prevention Resolution	Y	Worland City Code
City of Worland Flood Hazard Mitigation Plan	Y	2002
Subdivision & Development Regulations	Y	Worland City Code

As indicated in the table above, the City of Worland has several plans and programs that guide the City's mitigation of development in hazard-prone areas. Some of the plans identified in Table 7.3 are described in more detail in the following paragraphs. In addition, in 2011 the City passed a new ordinance regarding contractors. This ordinance increases fines on non-licensed contractors who attempt to do business with the City. The ordinance came about following severe hail storms in 2010.

### **City of Worland Flood Hazard Mitigation Plan, 2002**

The 2002 City of Worland Flood Hazard Mitigation Plan identifies flood risks in the planning area and lays out strategies to reduce those risks. The Plan also describes the planning and public involvement that contributed to the development of the document. The Worland Flood Hazard Mitigation plan includes a description and timeline of previous flood mitigation activities, particularly along Sage Creek which is identified as the primary flooding threat to Worland. The Plan establishes several overarching goals for flood mitigation in the City including mapping and several flood control projects. The 2013 Flood Chapter Addition

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included as Appendix D to the Regional Hazard Mitigation Plan includes updated information on Sage Creek.

### **Mobile Home Tie-Down Ordinance**

The City has enacted a tie-down ordinance to reduce the risk of damage from high wind and tornadoes. This was originally a project was identified in the 2005 Hazard Mitigation Plan. Per Ordinance 24-14 Mobile Home Residential District H. Securing And Skirting: All mobile homes shall be securely fastened to the ground to the satisfaction of the building inspector, if required, and if required by other sections of this code. All occupied mobile homes shall be skirted so that the under floor space is enclosed. Masonry skirting shall be laid up in mortar. (Ord., 6-20-1985)

### **Worland City Code**

The 2009 Worland City Code includes a multitude of ordinances relating to long-term planning, community development and public safety. The Code also establishes authorities required to implement and enforce these ordinances. Specific ordinances relevant to hazard mitigation include buildings and construction, fire protection and codes, flood damage prevention, health and sanitation, subdivisions, water and sewers, and zoning.

### **City of Worland Administrative and Technical Mitigation Capabilities**

Table 7.4 identifies the City personnel responsible for activities related to mitigation and loss prevention in the City of Worland.

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**Table 7.4. City of Worland Administrative/Technical Mitigation Capabilities**

<b>Personnel Resources</b>	<b>Y/N</b>	<b>Department/Position</b>	<b>Comments</b>
Engineer with knowledge of land development/land management practices	Y	City engineers	Donnell and Allred, Inc.
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Y	City engineers	Donnell and Allred, Inc.
Planner/engineer/scientist with an understanding of natural hazards			
Personnel skilled in GIS	Y		
Full-time building official	Y	City Engineer, City Planner and Building Inspector	
Floodplain manager	Y	County Planning Director	Per the Washakie County Flood Damage Prevention Resolution
Emergency manager	Y	Washakie County Homeland Security Coordinator	County
Grant writer	N		



Personnel Resources	Y/N	Department/Position	Comments
Public Works personnel	Y	Public Works director and staff	
Other personnel			
GIS data—Hazard areas	Y		See County data
GIS data—Critical facilities	Y		See County data
GIS data—Building footprints	Y		Partial, see County data
GIS data—Land use	Y		See County data
GIS data—Links to Assessor's data	Y		See County data
Warning systems/services (reverse 9-11, cable override, outdoor warning signals)	Y	Reverse 911 and Code Red Emergency Notification System	

Source: [www.cityofworland.org](http://www.cityofworland.org)

The following personnel/departments are involved in hazard mitigation in the City of Worland:

### **City Council and Mayor**

The City Council and Mayor comprise the governing body of the City of Worland. The City Council is made up of nine council members.

### **Planning and Building Department**

This department “administers the city land use planning and zoning activities, including comprehensive plan amendments, zone changes, conditional uses, variances, and planned unit permit issuance. [The department also] maintains the City’s comprehensive general plan in compliance with the State of Wyoming land use planning laws” (<http://www.cityofworland.org/commun.htm>).

### **Public Works**

The Public Works Department handles street repair and maintenance as well as maintenance of City buildings and grounds, sanitation, water, and sewer systems.

### **Worland Fire Department**

The Worland Fire Department provides fire protection and suppression throughout the community. Worland Fire Department is the home base for the Region 6 hazardous materials team.

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## 7.1.4 Town of Ten Sleep Mitigation Capabilities

### Town of Ten Sleep Regulatory Mitigation Capabilities

Table 7.5 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the Town of Ten Sleep.

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**Table 7.5. Town of Ten Sleep Regulatory Mitigation Capabilities**

Regulatory Tool (ordinances, codes, plans)	Y/N	Comments
County Comprehensive Plan	Y	
Zoning ordinance	N	
Subdivision Ordinance	Y	
Growth management ordinance	N	
Floodplain ordinance	Y	
Building codes	Y	
Fire department ISO rating	Y	6/6
Erosion or sediment control program	N	
Stormwater management program	N	
Site plan review requirements	Y	Building permits
Capital improvements plan	Y	Annual Budget Process for Infrastructure
Economic development plan	N	
Local emergency operations plan	Y	County EOP
Flood insurance study or other engineering study for streams	Y	"FIS for Washakie County, Wyoming and Incorporated Areas" dated March 2, 2009
Elevation certificates (for floodplain development)	Y	Aerial GIS Survey

### Town of Ten Sleep Administrative and Technical Mitigation Capabilities

Table 7.6 identifies the Town personnel responsible for activities related to mitigation and loss prevention in the Town of Ten Sleep.

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**Table 7.6. Town of Ten Sleep Administrative/Technical Mitigation Capabilities**

Personnel Resources	Y/N	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	Y	Town Engineer	
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Y	Town Engineer	
Planner/engineer/scientist with an understanding of natural hazards	Y	Town Engineer	
Personnel skilled in GIS	Y	Town Engineer	
Full-time building official	N		
Floodplain manager	Y	County Planning Director	Per the Washakie County Flood Damage Prevention Resolution
Emergency manager	Y		Countywide emergency manager
Grant writer	Y		Part-time
Other personnel	Y	Water, sewer	
GIS data—Hazard areas	N		Work in progress
GIS data—Critical facilities	N		Work in progress
GIS data—Building footprints	N		Some, work in progress
GIS data—Land use	Y	See County Data	
GIS data—Assessor's data	Y	See County Data	
Warning systems/services (reverse 9-11, cable override, outdoor warning signals)	Y	See County	

## 8 Mitigation Strategy

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This section describes the mitigation strategy and mitigation action plan for Washakie County. See Chapter 5 of the base plan for more details on the process used to develop the mitigation strategy.

### 8.1 Mitigation Goals

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During the 2016 development of the Regional Plan the Washakie County HMPC reviewed the goals from the 2011 plan. The group thought that they remained valid. The only suggestion was to add ‘identified’ to be more specific about the hazards profiled in the plan.

The updated plan goals are:

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- 1. Mitigate the effect of identified hazards through education, ordinances, resolutions, and clear definition and implementation of mitigation projects to reduce the loss of property and enhance life-safety of residents.**
  - 2. Coordinate mitigation activities with all entities of Washakie County to assess the identified hazards and take various actions to reduce or eliminate the risk factors of those hazards.**
  - 3. Reduce the economic impact on the local economy caused by the effects of identified hazards in the communities.**

## **8.2 Mitigation Actions**

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This section provides updates on the actions identified in the 2011 Washakie County Multi-Hazard Mitigation Plan and new actions identified during the 2016 Regional Plan development. During the 2016 Regional Plan development each action from the 2011 plan was discussed with the group. The group provided input on whether the action had been completed and if not reasons why. Some actions were determined to still be relevant and should continue in the updated plan. Others were recommended to be deleted. Much progress has been made on projects related to wildfire mitigation and various trainings. Action priorities were revisited and modified in some cases.

### **8.2.1 Progress on Previous Mitigation Actions**

The County and municipalities have been successful in implementing actions identified in the 2011 hazard mitigation plan, thus, working steadily towards meeting the plan goals. A process to evaluate the progress on the 2011 recommendations occurred when this plan was updated in 2016. This was done to determine which actions were completed, ongoing, in need of revision, or should be deleted from the plan. The participating communities, Washakie County Emergency Management, and HMPC members were provided a worksheet with a summary table of actions noted in the 2011 plan. This was to capture input from the planning team regarding:

- Was the action completed? If so, what made it successful?
- Is the action ongoing? Should it be changed or revised or deleted or deferred?
- Is the action not completed? Is the task still relevant and should it be included in the updated plan? If yes, how could it be improved?

Two planning meetings were held to discuss the progress on the actions and update the mitigation action table. The result of this process was an assessment of the current progress on the 2011 recommended actions, as a measure of plan implementation. As of August 2016 each community has made progress on many of the actions outlined in the 2011 plan. The progress on

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each action is noted at in the Status/Update Notes column on the Mitigation Action Table. Examples of progress made include:

- Continued installation of generators at critical facilities
- 400 NOAA All-hazard radio provided to schools, pre-schools and libraries
- Annual public awareness programs
- Updates to the Flood Insurance Rate Map in Worland

This assessment demonstrates that this plan is making a difference in reducing hazard losses in Washakie County. Completed projects are further detailed in Table 8.2.

In some cases there has been partial or little progress made on the action recommendations. In general this is due to the following:

- Long-range activity;
- Lack of resources, including staff and funding; and
- Low priority or shift in priorities.

Some action items from 2011 were deleted during the 2016 update. These are listed in Table 8.3 below, with a justification for deletion or alteration.

In some cases the projects identified will be implemented as funding becomes available. Certain projects listed in Table 8.1 do not fit the eligible project criteria for the Pre-Disaster Mitigation and Hazard Mitigation Grant Program, as set forth in 44 CFR, but could be funded through other sources.

## **8.2.2 Mitigation Action Plan**

Listed below are the active mitigation actions for the County; their status (continuing, deferred, new), and the related goals, primary agencies, and estimated costs involved. Per the DMA requirement, actions have been identified that address reducing losses to existing development as well as future development. Those that reduce losses to future development are indicated by an asterisk (\*) in the “Proposed Mitigation Project” column in 0. Also important to reducing losses to future development is continued compliance with the NFIP. The County and jurisdictions that participate in the NFIP (Worland and Ten Sleep) will continue to make every effort to remain in good standing with the program. This includes continuing to comply with the NFIP in regards to adopting floodplain maps and implementing, maintaining and updating floodplain ordinances. See Section 5.4.2 in the base plan for more on NFIP compliance.

**Table 8.1: Hazard Mitigation Projects – 2016 Washakie County Hazard Mitigation Plan**

Hazard	Proposed Mitigation Project	Project Priority Level	Jurisdictions Affected	Related Goal	Primary and Support Agency	Estimated Project Completion Date	Estimated Cost and Source of Funding	Status Update/Notes
All-Hazards, Winter Storm, Lightning, Hailstorm, Extreme Cold, Tornado, & Windstorm	Back-up power supply for shelters and critical infrastructure  ID key facilities in Worland and Ten Sleep (i.e., community center)	Medium	County Worland Ten Sleep	1	County Emergency Mgmt  American Red Cross	2020	\$ 200,000	<p><b>Continuing</b> Backup power supply need for life-safety, including provision of cooling during extreme high temperatures and heat during periods of extreme low temperatures.</p> <p>This project has been on-going since 2006: –Generators have been installed at EOC, County Public Health/Ambulance bay, and Search and Rescue (back-up dispatch center) – adjacent to County Fairgrounds Generator at fire substation installed for \$26,000</p> <p>As of 2016 the following facilities still need generators: -Senior Center -Community center -High school/middle school -Hospital -Ten Sleep senior center -Worland sewer lagoon Mobile generators could also be part of the solution Shelters have been identified by Red Cross and in WebEOC</p>

Hazard	Proposed Mitigation Project	Project Priority Level	Jurisdictions Affected	Related Goal	Primary and Support Agency	Estimated Project Completion Date	Estimated Cost and Source of Funding	Status Update/Notes
All-Hazards	Public awareness program to include promotion of 3-day kits (for home, work, and car), and distribution of hazard information to residents and businesses (including emergency facilities, public buildings and campgrounds) via information booths, talks, videos, telephone books, and brochures such as the “Living with Earthquakes” brochure.	Medium	County Worland Ten Sleep	1	County Emergency Mgmt Coordinator	2020 (Ongoing since 2006)	\$300 per year	<p><b>Continuing</b> Increased public awareness should lead to reduced impacts during an event.</p> <p>County Emergency Management has placed newspaper inserts into the paper one time per year. County Emergency Management has done radio talk shows and promotions on KWOR and had a booth at the County Fair and the Worland Health Fair one time per year with door prizes. Other public awareness activities have included:</p> <ul style="list-style-type: none"> <li>- Day care emergency preparedness meeting held.</li> <li>- NOAA WX Radio Promotion</li> <li>- Encourage awareness of sign up of “Radio notify” call back system (on county web)</li> </ul>

Hazard	Proposed Mitigation Project	Project Priority Level	Jurisdictions Affected	Related Goal	Primary and Support Agency	Estimated Project Completion Date	Estimated Cost and Source of Funding	Status Update/Notes
Multi-Hazards: Flood, Wildfire, Earthquake, Landslide, Expansive Soils, Avalanche, Dam Failure, Land Subsidence, Hazardous Materials	Provide GIS training for local jurisdictions with emphasis on hazards recognition and analysis for application in mitigation planning*  Build in-house GIS capability of various personnel (Assessor and planning)	Medium	County Worland Ten Sleep	2	County Emergency Mgmt Coordinator/ Assessor/ Planning	2020 (Ongoing since 2005)	Local Resources	<b>Continuing</b> GIS training will enable county to quickly analyze hazards and their potential impacts.  Assessor's office has been trained. Planner took GIS training in 2012 GIS data for the hazard mitigation plan can be utilized for training and applications for hazard mitigation. Washakie map server
Tornado, Lightning, Wind, Winter Storm	Establish tornado and severe weather shelter at ball park	Medium	Worland	2	Worland, NOAA	2021	TBD – possibly FEMA PDM grants	<b>Continuing</b> Identified in 2011 but deferred due to funding limitations. A tornado and severe weather shelter at the ball park will reduce the potential for injuries. This project would explore the shelter options and costs. Options explored in 2014, no funding available. Look for opportunities to incorporate into other improvements (restrooms, shops, etc.)



Hazard	Proposed Mitigation Project	Project Priority Level	Jurisdictions Affected	Related Goal	Primary and Support Agency	Estimated Project Completion Date	Estimated Cost and Source of Funding	Status Update/Notes
Droughts	Public awareness campaign	High	County-wide	1	Bureau of Reclamation, NOAA	Ongoing on quarterly basis	Agency resources \$500-\$1,000 for materials	<b>Continuing</b> Public awareness should help to conserve water in times of drought. The Bureau of Reclamation is conducting water supply forecasting and public education. This has been on-going with quarterly updates to councils, water users, mailings, etc.
Expansive Soils	Road mitigation for paved and unpaved county roads on soils with limited suitability	Low	County	1, 3	Washakie County, WYDOT	2020	STIP	<b>Continuing</b> Identified in 2011 and updated in 2016. Decrease the constant costs to maintain paved roads on limited soil suitability 2014 mag chloride road treatment with dust control – cuts down on need for grading roads WYDOT working on issue also
Expansive soils	Replace existing city water line. 21 miles of water line to access well water transverses areas of very fine grain “blow sand”	Low	Worland	1,2,3	Worland City Safety Director	2020	\$47 million Grant funding from the state or federal govt.	<b>Continuing</b> Existing line is vulnerable to expansive soils. Loss of water service creates threat to life and safety, including lack of water for firefighting, and causes economic loss when businesses are required to shut down. Only maintenance has been done since 2011. Priority in 2016 changed from medium to low as the City now has over

Hazard	Proposed Mitigation Project	Project Priority Level	Jurisdictions Affected	Related Goal	Primary and Support Agency	Estimated Project Completion Date	Estimated Cost and Source of Funding	Status Update/Notes
	which drastically loses shear strength when saturated.							2 mgd backup capacity through their participation in the Big Horn Regional system.
Flood	Continued compliance with NFIP*	High	County	1,2,3	County floodplain administrator and elected Officials	Ongoing with annual activities	County staff resources	<b>Continuing</b> Continued compliance with the NFIP will help reduce future flood losses through periodic ordinance update and enforcement, promoting flood insurance, etc. Added as specific project in 2011 See related projects on map update, flood insurance promotion 2013 Flood Annex Developed to HMP
Floods	Sage Creek Flood Control	High	Worland, County	2,3	County City of Worland, NOAA	2021	\$50,000 for plan \$500,000 for project	<b>Continuing</b> Flood control projects will reduce the impacts of floods. FMA Planning Application funded in 2011; FMA Plan completed as annex to HMP in 2013 and identifies in more detail mitigation options on Sage Creek. The recommended alternative needs to be funded and implemented to further reduce risk.

Hazard	Proposed Mitigation Project	Project Priority Level	Jurisdictions Affected	Related Goal	Primary and Support Agency	Estimated Project Completion Date	Estimated Cost and Source of Funding	Status Update/Notes
Floods	Sage Creek Flood Insurance Map Update*	Medium	Worland	2,3	City of Worland/US Army Corps of Engineers	2012-2013	Map Modernization Program	<b>Completed</b> Flood insurance rate maps define flood boundary areas. A Letter of Map Revision (LOMR) was approved in 2013 which provided more accurate flood hazard mapping that removed approximately 150 homes from floodplain in Worland
Floods	Public awareness of flood insurance availability	High	Worland, County	1,2,3	City and County Planning Offices Mortgage Lenders State OHS	Ongoing with annual or bi-annual activities	Agency resources	<b>Continuing</b> Public awareness of insurance serves to increase awareness of floods.  This project may entail having the WOHS provide refresher training for Insurance lenders Examples of awareness efforts include newspaper article 4-2013 July 2013 Flyers put in mailboxes of homeowners
Floods	Continued compliance with National Flood Insurance Program*	High	Worland	1,2,3	Worland floodplain administrator and Elected Officials	Ongoing annually	Worland City Staff resources	<b>Continuing</b> Continued compliance with the NFIP will help reduce future flood losses through periodic ordinance update and enforcement, promoting flood insurance, etc. Added as specific project in 2011 Ongoing See related projects on map update, flood insurance promotion, CRS

Hazard	Proposed Mitigation Project	Project Priority Level	Jurisdictions Affected	Related Goal	Primary and Support Agency	Estimated Project Completion Date	Estimated Cost and Source of Funding	Status Update/Notes
Flood	Continued compliance with NFIP*	High	Ten Sleep	1,2,3	Ten Sleep Elected Officials	Ongoing annually	Ten Sleep staff resources	<b>Continuing</b> Continued compliance with the NFIP will help reduce future flood losses through periodic ordinance update and enforcement, promoting flood insurance, etc. Added as specific project in 2011 Ongoing See related projects on, flood insurance promotion Ten Sleep experienced floods in 2012 and 2014 and continues to participate in the program.
Flood	Relocate Public Works building	Medium	Worland	1	Worland Public Works	2021	\$1 million, State or federal grants	<b>Continuing</b> Public Works building is currently in 500-year floodplain. This project would explore alternative locations. Actively under consideration as of 2016 and has not yet been implemented due to need for funding assistance.
Flood	Replace culverts in areas of repetitive flooding with higher capacity ones , including on roads to Sales Barn (state, city) and South Flat (state)	High	County	3	Washakie County Road & Bridge	2021	Cost unknown at this time  State or federal grants	<b>Continuing</b> County roads wash out nearly every year due to rain and floods. Identified in 2011 but specific areas have not been addressed due to funding limitations.

Hazard	Proposed Mitigation Project	Project Priority Level	Jurisdictions Affected	Related Goal	Primary and Support Agency	Estimated Project Completion Date	Estimated Cost and Source of Funding	Status Update/Notes
Hazardous Materials	Relocate fire station out of hazmat risk area	High	Worland	1,2,3	Worland Fire District	2021	\$4 million	<b>Continuing</b> Facility's proximity to railroad line places it at risk of exposure to hazardous material incidents. All hazmat response is in this building.  No Action as of 2016 due to funding needs
Hazardous Materials	Establishment of alternate truck bypass route – "North Worland Project"	High	Worland	1,3	Worland Board of Adjustment and Planning  WYDOT	2021	\$864,000	<b>Continuing</b> Bypass routes can reduce the potential for accidents because they avoid high traffic and densely populated areas.  As of 2016 this project is still under consideration and ongoing.
Hazardous Materials	H2S training for first responders and City and County employees	High	County-wide	1	Local oil companies; LEPC To help fund employer training (if needed)	Ongoing annually as of 2016	Company resources, LEPC HMEP Grants \$2,600/yr	<b>Continuing</b> H2S training increases awareness of the hydrogen sulfide hazard and may decrease response time to incidents. LEPC can help train people to be aware of the hazard. LEPC purchased DVD video for hazmat library in 2013. Fire and EMS personnel receive training on annual basis
Wildfires	Update Community Wildfire Protection Plan and integrate with the Hazard Mitigation	Medium	Worland, Ten Sleep	1, 2, 3	County Fire Warden, Worland Fire District, Ten Sleep Fire District, State Forestry, BLM	2020	\$25k for planning assistance for update	<b>Continuing and Revised in 2016</b> Continuation of CWPP Planning will identify potential means of preventing and/or responding to wildland/urban interface fires. Funding sources are being identified to begin a CWPP update for Washakie and Big Horn Counties. Tentative plans call

Hazard	Proposed Mitigation Project	Project Priority Level	Jurisdictions Affected	Related Goal	Primary and Support Agency	Estimated Project Completion Date	Estimated Cost and Source of Funding	Status Update/Notes
	Plan when funding is secured.							for a joint project with Wyoming State Forestry, BLM, and the County Fire Warden from both counties, possibly beginning as early as Fall 2016.
Wildfires	Hazard awareness for residents of Canyon Creek Country cabin development, Big Horn River Bottom, Canyon Creek Village	High	County and Ten Sleep	1	Bureau of Land Mgmt  County Fire Warden,  Ten Sleep Fire Dept	Ongoing	Agency resources	<b>Continuing</b> Drought conditions, vegetation, and terrain place area at high risk of fire.  Updated in 2011 to include Big Horn River Bottom and Canyon Creek Village. Some aspects of this project have been completed including Firewise workshops. NOAA has Wildfire Ready awareness program materials. Firewise grant put in place; firewise position hire 2013; A Type I and a Type IV fire engine have been placed at Canyon Creek Country as of 2015.
Wildfires, Flood (Ice Jam)	Winchester River Bottom (fuel reduction)	High	County	1,2	Bureau of Land Mgmt  County Fire Warden	2005/2006 Ongoing in 2016-17	NRCS	<b>Continuing</b> Fuel reduction will reduce the likelihood or severity of fires.  As of 2016 Russian Olive removal has been ongoing using NRCS funding. A secondary benefit of this program is reduction in ice jam flood potential.
Flood	Put backflow prevention devices (“duckbill” check valves) on the	High	Worland	1	Worland Public Works	2019	Approximate -ly \$45,000	<b>New in 2016</b>

Hazard	Proposed Mitigation Project	Project Priority Level	Jurisdictions Affected	Related Goal	Primary and Support Agency	Estimated Project Completion Date	Estimated Cost and Source of Funding	Status Update/Notes
	Worland storm sewer outlets, starting with the three draining into the Big Horn River (between old and new bridge).							
Multi-Hazard: Avalanche, Earthquake, Extreme Cold, Dam Failure Hailstorm, Lightning, Winter Storm, Tornado Wind, Wildfire, Hazardous Materials	Implement an Integrated Public Alert and Warning System (IPAWS) alert system as the next generation of the Emergency Alert System.	Medium	County	1	County Homeland Security	2017	Low	<b>New in 2016</b> This includes certification and training of the County Homeland Security Coordinator to administer the system.

\*Addresses losses to future development

Goal 1: Mitigate the effect of identified hazards through education, ordinances, resolutions, and clear definition and implementation of mitigation projects to reduce the loss of property and enhance life-safety of residents.

Goal 2: Coordinate mitigation activities with all entities of Washakie County to assess the identified hazards and take various actions to reduce or eliminate the risk factors of those hazards.

Goal 3: Reduce the economic impact on the local community caused by the effects of identified hazards in the communities.

**Table 8.2: Completed Hazard Mitigation Projects from 2011 Washakie County Hazard Mitigation Plan**

Hazard	Proposed Mitigation Project	Project Priority Level	Jurisdictions Affected	Related Goal	Primary and Support Agency	Estimated Project Completion Date	Estimated Cost and Source of Funding	Status Update/Notes
Multi Hazards: Avalanche, Earthquake, Extreme Cold, Dam Failure Hailstorm, Lightning, Winter Storm, Tornado Wind	Encourage residents, businesses, and schools to purchase NOAA weather radios.	Medium	County-wide	1,2,3	County Emergency Mgmt Coordinator	Ongoing	Local Resources	<p><b>Completed</b></p> <p>NOAA radios will quickly inform residents of hazards.</p> <p>400 radios purchased 5/15/2014 Provided to schools, pre-schools and libraries Handed all radios out at various events</p>
Wildfire, Hazardous Materials	Hire fire prevention officer*	High	Worland and Ten Sleep	2	Ten Sleep Fire Dist, & Worland Fire Dist, County fire warden	2013	\$55,000 per year (wages and benefits)	<p><b>Completed</b></p> <p>Identified in 2011. This position would implement public relations, education, and outreach programs. Completed in 2013 by Worland Fire District and County, ongoing prevention and education efforts. Firewise coordinator and Firewise program in place</p>



Dam Failure	Meadowlark Dam	Medium	County, Ten Sleep	1, 2	Ten Sleep, US Forest Service, County Emergency Management	2014	Unknown USDA	<b>Completed</b> Dam is 80 years old USFS to revise EAP Revise and exercise plan Install sensors Recent USFS study and inundation map done. Inundation map completed and EAP revised 5/12/2014
Floods	Explore joining National Flood Insurance Program Community Rating System*	Medium	Worland	1,2,3	Worland	2013	Can be accomplished with City staff resources	<b>Completed</b> but Not Applicable Joining the CRS could lower flood insurance premiums for city residents. This project would explore the cost/benefit of joining the CRS. A related activity would be an annual notification/brochure to residents in the floodplain This project was new to the plan in 2011 and was explored by City and County in April 2013. Both decided to opt out of this voluntary program based on a low return on investment.
Landslide/Rockfall	Support ongoing WYDOT efforts to mitigate rockfall hazards in high risk areas along HWY 16 east of Ten Sleep	Medium	County-wide	1, 2	WYDOT	2012	WYDOT	<b>Completed</b> Added as project in 2011 Completed in 2012. WYDOT hired a rockfall specialist and a 2011 project addressed worst area.

**Table 8.3: Deleted Hazard Mitigation Projects from 2011 Washakie County Hazard Mitigation Plan**

<b>Hazard</b>	<b>Proposed Mitigation Project</b>	<b>Project Priority Level</b>	<b>Jurisdictions Affected</b>	<b>Related Goal</b>	<b>Primary and Support Agency</b>	<b>Estimated Project Completion Date</b>	<b>Estimated Cost and Source of Funding</b>	<b>Status Update/Notes</b>
Flood	Replace bridges at risk to flood damage, including the bridge in Winchester	High	County	3	Washakie County Road & Bridge	2015	Cost unknown at this time  State or federal grants	<b>Deleted</b> The Winchester bridge is one of the oldest in the state and at risk to being destroyed in a flood. Project deleted in 2016; Not a flood risk, though bridge is structurally deficient
Wildfires	Lower Ten Sleep Canyon (fuel reduction and construction of holding pond)	High	Ten Sleep	1,2	Bureau of Land Management/ County Fire Warden	2005/2006	Unknown	<b>Deleted</b> Holding pond was identified as a need for firefighting purposes. BLM investigated and determined it was not feasible.

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### 8.2.3 Implementation

Moving forward the County HMPC will use the mitigation action table in the previous section to track progress on implementation of each project. As noted in the action table Status Update column much progress has been made since the plan was originally developed in 2007. Implementation of the plan overall is discussed in Chapter 6.

#### Incorporation into Existing Planning Mechanisms

Also discussed in Chapter 6 is the importance of implementation and incorporation of the principles of this plan into other planning mechanisms.

As described in the capability assessment, the County and municipalities already implement policies and programs to reduce losses to life and property from hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through these other program mechanisms. Where applicable, these existing mechanisms could include:

- County or community comprehensive plans
- County or community development codes
- County or community Emergency Operations Plans
- Threat and Hazard Identification and Risk Assessments (THIRA)
- Community Wildfire Protection Plan (CWPP)
- Capital improvement plans and budgets
- Recovery planning efforts
- Watershed planning efforts
- Wildfire planning efforts on adjacent public lands
- Master planning efforts
- River corridor planning efforts
- WYDOT rockfall and landslide mitigation efforts
- Other plans, regulations, and practices with a mitigation aspect

During the 2016 planning process the HMPC discussed the importance of coordinating the mitigation plan with other planning processes, and vice versa. To date the plan has not been integrated with other planning efforts. The group discussed opportunities to cross reference the hazard mitigation plan in other upcoming planning efforts. The County Comprehensive Plan was noted as a possibility. The next update of the Community Wildfire Protection Plan will be another possibility once funding is secured.